

## On the Semantics of "Ability Attributions"

"In philosophy, it is *can* in particular that we seem so often to uncover, just when we had thought some problem settled, grinning residually up at us like the frog at the bottom of the beer mug."  
(Austin 1970: p.231)

### 0. Introduction

This paper is an investigation into the semantics of ability attributions ("AAs"), i.e. sentences (or utterances) that are used to ascribe some individual some ability. AAs come in various different shapes, and forms and the extent to which the components responsible for their distinct semantics are disguised or shown transparently varies accordingly. Below are a few examples to give an impression of the range of facts that I think belong ultimately to this group.<sup>1</sup>

- (1) a. John can solve the third math problem of the last assignment.
- b. John is able to solve the third math problem of the last assignment.
- c. John is capable of solving the third math problem of the last assignment.
- d. John has the ability to solve the third math problem of the last assignment.
- e. The third math problem of the last assignment can be solved.
- f. The third math problem of the last assignment is easy to solve.
- g. The third math problem of the last assignment is solvable.
- h. This bread cuts easily
- i. This car goes 20 miles an hour.<sup>2</sup>

Since it is not possible, within the limits of this paper, to give an account of all the linguistic phenomena that fall under that heading, I will have to make choices as to what kind of data I pay attention to and which ones I set aside. The focal point of interest will be *can*. The main motivation is that I hope to be looking at the semantic core of AAs while getting enough support from the syntax to sort out a notoriously difficult to handle array of facts. The ultimate goal is of course, that once we understand what the components are that give AAs their distinct meaning and how they work together, we can go back to the data that disguise their structure and give an informed analysis of their syntax.

### The main proposal

I argue that there are three essential components to the semantics of AAs and the related constructions in (1): 1. An existential modal operator 2. whose restrictor (the modal base) is "circumstantial"<sup>3</sup> and whose content is determined pragmatically (by the conversational background) and 3. The complement of the modal operator is a "change of state" denoting

<sup>1</sup>Note that, I don't mean to claim that the sentences in (1) all have exactly the same meaning, rather I'd like to suggest that there is a semantic core that is common to all of them and understanding the compositional semantics of the core might help us to understand the syntax of these constructions better, in turn.

<sup>2</sup> due to Kratzer (1991)

<sup>3</sup> in the sense of Kratzer (1981,91) see sect. 1.1 for the specifics.

predicate which I will encode formally as cause/voice phrase in the sense of Kratzer (1994). I suggest furthermore that the differences in the meanings and syntactic behavior that correlates with the various meanings of these constructions arise because of standardly assumed morpho-syntactic operations that target the specifier of VoiceP (e.g. "passivization") and/or by the specific choice of the restrictor of the modal. The proposal is intended to cover the entire class of AAs as represented (non-exhaustively) by the sentences in (1). Justifying this hypothesis in its full generality is of course not possible within the limits of this paper. As mentioned already, I will focus on *abilitative-can*<sup>4</sup> the semi-modal *be-able-to* (occasionally contrasting it with *be-capable-of*).

The paper is organized as follows: Section 1 is a first attempt to give the semantics of sentences like (1a) in essentially "traditional" modal logic terms. In order to do that, I introduce briefly Kratzer's framework to analyze modality (Kratzer 1978, 1981, 1991). The section ends with a sketch of two potential problems: 1. Lack of duality in AAs and 2. A question concerning the right characterization of truth conditions for AAs.

I take these problems to motivate refining Kratzer's treatment rather than abandoning it. In section 2 I state my proposal what these refinements should be. In section 3 I go on to motivate all the components I take to be crucial for the semantics of AAs. 3.1 argues for the necessity of a "change denoting" complement of the modal. In a nutshell: if the complement is stative, the *abilitative-can* reading of *can* is not available. 3.2 argues for existential force of the operator as well as the special properties of the restrictor of the modal operator. Both are necessary to give a complete account for the lack of duality in AAs. 3.3 shows that the variety of meanings for *abilitative-can* can be accounted for by assuming different specific modal restrictors in each case. I argue that the conversational background provides enough flexibility to accomplish that task. I close the section discussing briefly the implications for the syntactic realization of *abilitative-can*. I show that there are two syntactic configurations to encode the bare semantic skeleton, each of them being independently motivated. In section 4 I go back to the question what the right truth-conditions are. Specifically, it addresses the question whether generic quantification over situations or existential quantification over worlds is the right way of looking at it. I propose, picking up a suggestion made in Kratzer (1989), that in a special case, existential quantification over worlds and generic quantification over situations represent two sides of the same coin, the characterize non-accidental properties or generalizations of the world of evaluation. This hypothesis crucially relies on the assumptions made about the particular properties of the restrictor of the modal operator of AAs and therefore constitutes further evidence in favor of that assumption. It's corollary in a situation based framework is the hypothesis that (at least some) propositions namely those that express non-accidental generalizations of the world of evaluation are persistent. Thus, my proposal supports Kratzer's (cf. also Lasnik (1995)) claim that persistence is a property of natural language propositions.

<sup>4</sup> Note that I use *abilitative-can* here and through-out the paper to refer to a quite lively class of meanings associated with *can*. I use *ability-can* to refer specifically to something like *John can swim*.

## 1. *Abilitative-Can* as "dynamic"<sup>5</sup> modal

The common treatment that *abilitative-can* gets (at least in linguistic papers) is that it is honored with the title "[...] dynamic modality which is concerned with ability and dispositions [...]" and then set aside because "[...] it is doubtful whether this should be included within modality at all." (Palmer 1986:12<sup>6</sup>) Quite often, there is not even an attempt to clarify what is meant with the label "dynamic". In the next section, I'll try to spell this out. The section serves two purposes at the same time, first it'll allow me to introduce the framework I use to analyze modals and second it'll allow me to introduce and discuss some evidence to causes suspicion that *abilitative-can* behaves like any old modal.

### 1.1 Kratzer's framework

Initial motivation to treat *abilitative-can* on a par with other modal statements as in (2) is both morpho-syntactic as well as semantic: In English and many other languages a morpho-syntactically defined class of lexical items (modal verbs) is used in both cases.

- (2) a. John must solve the third math problem of the last assignment.  
b. John might solve the third math problem of the last assignment.  
c. John can vote in the US because he is a US citizen.  
d. John can be in the car waiting for us to come outside.

Quite often, the same phonological address (word) is used in various modal statements, AAs seem to be just one particular case. The suspicion is, of course, that this notorious polysemous behavior is not accidental but that there is a common core that gets "fine-tuned" in specific environments. As for the semantics, the central idea is that both "regular" modal statements as well as AAs involve quantification over possible worlds, i.e. they are treated as modal operator. Indeed, one of the nice features of Kratzer's framework is that it accounts for the polysemous nature of modal verbs in a very elegant way while maintaining the intuition that they are in essence quantifiers operating over sets of possible worlds. According to Kratzer, modal statements can be described along three dimensions: 1. the quantificational force, 2. the modal base (the set of all accessible worlds) and 3. an ordering source on the base.

1. Kratzer's treatment follows the tradition in modal logic in that it assumes restricted quantification over possible worlds to be at the heart of the matter. The possibility operator ( $\Diamond$ ) and necessity operator ( $\Box$ ) of propositional intensional logic can be defined in terms of existential and universal quantification over possible worlds respectively: A model  $\mathbf{M}$  for modal propositional logic consists of (i) an non empty set  $W$  of possible worlds; (ii) a binary relation  $R$  on  $W$ , the accessibility relation and (iii) a valuation function  $V$  which assigns a truth value

$V_w(p)$  to every proposition letter  $p$  in each world  $w \in W$ . In such a model we can define the truth value of a formula  $\Diamond\phi$ ,  $V_{M,w}(\Diamond\phi)$  and  $\Box\phi$ ,  $V_{M,w}(\Box\phi)$  respectively as in (3):<sup>7</sup>

- (3) a.  $V_{M,w}(\Box\phi) = 1$  iff for all  $w' \in W$  such that  $wRw'$ :  $V_{M,w'}(\phi) = 1$   
b.  $V_{M,w}(\Diamond\phi) = 1$  iff for at least one  $w' \in W$  such that  $wRw'$ :  $V_{M,w'}(\phi) = 1$

2. In Kratzer's system the restrictor of the modal operator, the set of accessible worlds, is assumed to be provided by the conversational background. The conversational background function "R" is understood as a function that maps the world of evaluation ( $w$  in the above formula) onto a set of accessible worlds ( $W'$ ). Depending on the kind of conversational background different worlds are accessible from the world of evaluation. These different modal bases are responsible for the various meanings of the modal. Since conversational backgrounds are very shift, a lot of flexibility is introduced into the system which accounts for the (apparent) polysemy of modals. To illustrate, consider the sentence in (4) and the different interpretations that are available and made explicit given a certain conversational background.

- (4) John must be in his office  
a. ..., in view of the evidence available  
b. ..., in view of what the laws/rules provide

(4a) is commonly referred to as "epistemic" use of *must* while the interpretation made prominent in (4b) is called "deontic". The different interpretations arise because different modal bases are determined by the conversational background in (4a) and (4b). The modal base is that set of worlds that the conversational background determines as accessible from the world of evaluation. Assuming that *must* expresses necessity we can now say that the modal base provides the restrictor of the universal quantifier *must* which relates two sets of worlds, the modal base and the set of worlds  $w$  in which  $p$  is true in the following way: (4) is said to be true in the world of evaluation iff all worlds of the modal base are worlds in which 'John is in his office' is true.

3. The third dimension is an ordering relation which is assumed to be provided by the conversational background as well. It imposes a partial ordering on the modal base, i.e. given a modal base the ordering source allows us to identify the "most lawful" or "most stereotypical" world or worlds, compared to more or less lawful, stereotypical worlds in the base. This notion allows Kratzer to elegantly solve problems with inconsistencies in the modal base, the notorious Samaritan<sup>8</sup> Paradox as well as express graded modality.<sup>9</sup> With these three tools at hand, we can already try to give a first approximation of the semantics of *abilitative-can*:

<sup>7</sup> cf. Gamut (1991)v2 : 22 - 23

<sup>8</sup> Here is a version of the paradox (due to Kratzer1991): Let us assume that the law provides the following. i. No murder occurs. ii. If a murder occurs, the murderer will go to jail. Given a standard analysis of modality and of conditional sentences in terms of material implication, the following statements should all be true. a. It is necessary that if a murder occurs, the murderer goes to jail. b. It is necessary that if a murder occurs, the murderer will be knighted. c. It is necessary that if a murder occurs, the murderer will be given 100\$. ... This is so because as soon as a murder occurs any conditional will be true since the antecedent of the conditional is false. Obviously, there are two possibilities to address this problem: modify the analysis of modality or of conditionals. Kratzer's point is essentially

<sup>5</sup> cf. e.g. Palmer (1986) who attributes the label "dynamic" to von Wright (1951)

<sup>6</sup> Palmer continues: "It will not merit separate consideration in this book, except for the discussion of its status and relation to other modalities." *ibid.*

1'. Since *can* denotes an existential quantifier in its epistemic or deontic (cf.5) use rather coming with universal or quasi-universal force, the null-hypothesis is the quantificational force of *abilitative-can* will be existential as well. This allows us to keep to minimal assumptions about the lexical inventory of modals, i.e. that there is one lexical entry /can/ that gets its various interpretations from the restrictor provided by the conversational background.

- (5) John can be in his office
- a. ..., in view of the evidence available
  - b. ..., in view of what the laws/rules provide
- epistemic*  
*deontic*

2'. The modal base is according to Kratzer a "circumstantial" modal base. A circumstantial base is given by a function that looks at specific facts of the world of evaluation and maps the world of evaluation onto a set of worlds, all of which have the property that the relevant facts hold in them as well<sup>10</sup>. Kratzer's examples to illustrate the notion circumstantial base as opposed to epistemic base are given in (6)

- (6) a. Hydrangeas can grow here  
b. There might be hydrangeas growing here

(6a) states that the location identified by 'here' has the capacity (in the world of evaluation) to support hydrangeas because of the climate, the soil, .... It can be true irrespective of whether there are hydrangeas growing there or whether the speaker has some independent knowledge that there are actually no hydrangeas growing there. (6b), on the other hand, would be a false statement if the speaker had independent knowledge that there are actually no hydrangeas there, "Using a circumstantial modal, we are interested in the necessities implied or the possibilities opened up by certain sorts of facts" (Kratzer(1991:646))

3'. To capture Kratzer's intuition quoted in the previous paragraph, it has to be assumed that the (relevant) natural laws (e.g. governing growth of hydrangeas) that characterize the world of evaluation hold in all the worlds given by a circumstantial base as well. I.e. underlying the construction of a circumstantial base there is notion of closeness or stereotypicality of accessible

that the analysis of conditionals has to be redone but crucially in a way that requires a system of modality that does have partially order sets of accessible worlds which is achieved by the ordering source.

<sup>9</sup>cf. (Kratzer 1991)

<sup>10</sup> I simplified Kratzer's (1991) treatment slightly. In that paper, both circumstantial as well as epistemic base are instances of a *realistic* base. A realistic base is one that maps the world of evaluation to a set of worlds all of which have the property that the relevant facts are true in them. The difference between circumstantial and epistemic base according to Kratzer is that, the kinds of facts that are relevant in each case are different in nature. Intuitively, facts that are "accessed through attitudes" (believes or justified believes) are different from facts per se. Deontic, bouletic, ... modality comes about if a certain ordering (w.r.t what the law provides, what the desires are,...) is imposed on a circumstantial base. AAs typically have a circumstantial without any ordering imposed and if there is an ordering it is *stereotypical* w.r.t to normal course of development of a world. There is no attempt to give a more precise description in Kratzer's paper, so I go with my more intuitive but simplified version. However, Kratzer speculates that epistemic vs circumstantial base might differ as to which argument structure is (typically) associated with it - picking up a traditional distinction between root and epistemic modals.

worlds. For the rest of the paper I will abstract away from that notion by simply talking only about the set of closest, most stereotypical worlds. There is a related issue, that deserves brief mentioning, namely how "degrees of ability" can be represented. Or more precisely, how abilities can be compared across individuals that have these abilities cf. (7b,c). The ordering source seems to be the obvious tool to use. E.g. one could think of comparing abilities in terms of how rich the felicity conditions have to be so that the subject of the AA succeeds in bringing about the situation in question.<sup>11,12</sup>

- (7) a. John can easily beat Bill in chess  
b. A stunt man can fall from the top of a ten story building and not be hurt.  
c. John can read a Chinese news paper without the help of a dictionary

Assuming this general way of looking at modality, we can analyze ability-can as existential modal operator that takes a circumstantial restrictor ("R<sub>c</sub>") and assign a sentence like (8a) a quasi-LF as in (8b). It can be paraphrased as in (8c) to give an informal way of characterizing its meaning:

- (8) a. John can swim  
b.  $\exists w[R_c w] \& [John \text{ swims in } w]$   
c. "Given John's physical and mental properties in w there is a world w' accessible from w such that John swims in w'"

This is, at best, only the skeleton of an adequate analysis of the semantics of AAs, and *abilitative-can* in particular. However, we can already see two potential problems that the proposal in (8) has to face. I'll sketch both of them below and use them in turn to refine the analysis.

## 1.2 Lack of Duality

One of the benefits of analyzing modals as existential or universal quantifiers over possible worlds is that intuitions about the duality of possibility and necessity are explained in a straightforward way. As can be seen in (9), for a given modal base and ordering source possibility can be expressed in terms of negation combined with necessity and vice versa.

- (9) a. You must be quiet.  
b. You may not be not quiet.

Given the interpretation of *must* and *may* as restricted universal and existential quantifiers over possible worlds, the equivalence of statements like (9a,b) boils down to the following equivalence:

<sup>11</sup> How exactly abilities are compared or relativized is not obvious. The linguistic means to make ordering sources explicit are typically "expense-denoting" adverbs like *tough-adj/adv* and infinitival adjunct clauses. See Hackl (in prog.) for more on the semantics, and syntax of *tough-adjs/advs*.

<sup>12</sup> Sabine Iatridou (p.c.) points out, that one could think of degrees of ability also as different kinds of abilities.

- (10) a.  $\neg\exists w [\neg p(w)] \leftrightarrow \forall w [p(w)]$

Treating AAs as instances of modal statements as assumed above, we expect duality to hold for them too. I.e. we expect to be able to construct equivalent sentences to (11a) that involve modals with universal force and negation as suggested in (11b,c) and (12b).

- (11) a. John can swim.  
 b. John need not not swim.  
 c. It is not the case that John mustn't swim<sup>13</sup>
- (12) a. John can't swim  
 b. John must not swim

The problem is that speakers' intuitions deny equivalence in the examples above: neither (11b) nor (11c) can express a statement about John's abilities. This is obviously unexpected under the existential analysis and therefore *prima facie* a problem for it. Quite generally, it seems that if a language uses a modal to express an AA it is an existential modal and it seems to lack a universal dual. If this is correct, we need a principled way to explain that gap in the modal paradigm.

### 1.3 Are the truth conditions too weak?

Another potential problem of this proposal, that comes immediately to mind, is that the truth-conditions are very weak and might in fact be *too* weak. Under this analysis, for a sentence like (13a) to be true it would only be required that there is at least one world among the universe of accessible worlds in which John swims. Some more examples that bring it out more clearly that we seem to associate stronger truth-conditions with AAs than existential quantification are given in (13b,c)

- (13) a. John can swim.  
 b. John can answer this question  
 c. This elevator can lift 1500 lbs.<sup>14</sup>

(13b) doesn't just mean that there is a circumstantially accessible world in which John answers the question, rather it says that he has the answer (or will get it) and in all worlds in which he is willing to tell you the answer and nothing prevents him from doing so, he will give it to you. Likewise, (13c) would not reflect appropriately the level of confidence the speaker has in the elevator if there is only a chance that the elevator lifts 1500 pounds. Universal or quasi universal force again seems more appropriate than simple possibility: under normal circumstances and normal operating conditions, in all cases in which the elevator has to lift 1500 lbs it will accomplish it. Thus, we might propose a altogether different LF to represent the semantics of AAs that involves generic quantification over situations as indicated in (14) (cf. e.g. Carlson et al. (1995)) rather than existential quantification over worlds.

<sup>13</sup> For independent reasons English 'must' always takes scope over clausemate sentential negation. Need on the other hand is an NPI when used as modal and clearly has universal force.

<sup>14</sup> This example is attributed to Maria Bitner by Irene Heim (p.c.)

- (14) a. John can swim  
 b.  $\text{GENs}[John \text{ in } s \ \& \ C(s)] \ \exists s'[s \text{ overlaps with } s' \ \& \ John \text{ swims in } s']$ <sup>15</sup>  
 c. "All situations that include John and certain felicity conditions are met are expandable to situations in which he swims."

If we allow the set of felicity conditions that restricts the generic operator to be rich enough, e.g. John has to be alert in *s*, he has to have the desire to swim in *s*, there has to be enough liquid to swim in *s*, ..., then this appears to be an adequate way of describing the truth conditions for sentences like (13a-c).

Within a situation semantic framework as proposed in Kratzer(1989), Heim(1990), the relationship between situations and worlds is well defined. Informally, a world is a conglomerate of situations varying in size and extension in time and location. If the part-whole relation (" $\leq$ ") is defined over the set of situations, worlds can be simply understood as "maximal situations" that aren't part of any other situation (but themselves).<sup>16</sup> Hence, there is a consistent way within the framework of situation semantics of asking the question whether *abilitative-can* is to be understood as generic quantifier over situations or as existential quantifier over worlds (maximal situations). Deciding the question seems at first sight very difficult, though, because quite generally, it seems possible to mimic existential force with a universal quantifier if we enrich the restrictor sufficiently. Since the restrictor of modals and the generic operator is usually provided by the conversational background, it is very difficult to control for how the restrictor is filled. Thus, the question whether existential quantification over worlds or generic quantification over situations is correct is hard to decide without independent evidence. In the last part of the paper I will argue that the question as stated here is in fact not to be decided by the semantics but rather the pragmatics that selects a reference level of proficiency. However there is a closely related issue that has to be addressed by the semantics, namely what exactly the relation between generic quantification over situations and existential quantification over worlds is. Evidence that they are closely related is abundant. Note for instance that the present tense generic sentence (15b) has both a habitual and an abilitative interpretation under which it means the same as (15a).

- (15) a. John can play chess  
 b. John plays chess.

## 2. The Proposal

Rather than taking these two problems as serious enough to abandon a treatment of AAs in terms of modal quantification,<sup>17</sup> I'd like to pick up the challenge and propose one fairly straightforward amendment to Kratzer's analysis. I argue that assuming a restriction on the nature of the complement of the modal operator together with paying close attention to the specific properties

<sup>15</sup> I borrowed the overlap relation from Chierchia(1995)

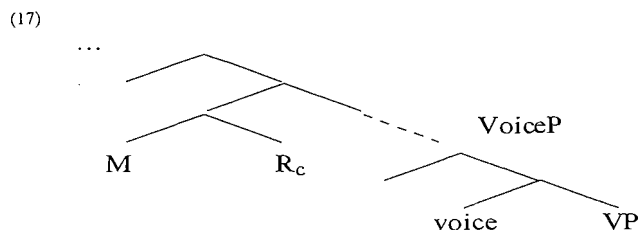
<sup>16</sup> Usually, it is assumed that for every situation *s* there is exactly one maximal situation *s'* such that  $s \leq s'$ .

<sup>17</sup> cf. Barbiers (1996) for a non-quantificational approach.

of the components already in place (existential modal quantification restricted by a circumstantial base) will allow a complete account of the various properties of AAs. Specifically, I'd like to propose that there are 3 essential components that together give rise to the semantics of AAs. I assume furthermore that these components are projected in the syntax<sup>18</sup> which implies minimally that the structure in (17) is present in AAs:

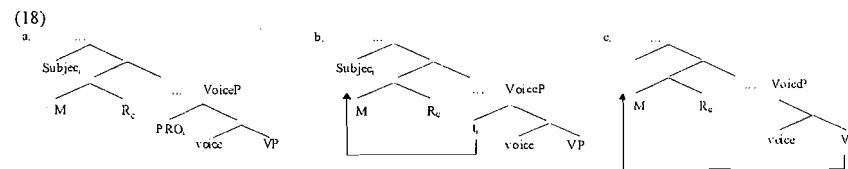
### (16) Three essential components of Ability Attributions

1. An modal operator (M) with existential force that relates sets of possible worlds (denoted by the restrictor  $R_c$  and the nuclear scope)
2. A "circumstantial" restrictor ( $R_c$ ) (in the sense of Kratzer 1981,1991) whose specific content is determined by the conversational background.
3. The complement of the modal operator is a "change of state denoting" predicate which I assume to be Cause/VoiceP in the sense of Kratzer(1994)



I'll refer occasionally to this structure as "the skeleton of AAs" and propose that whenever these three components come together, we get the basic semantics of AAs. Furthermore, I'd like to suggest that all variations on that theme are determined along 2 dimensions: 1. morpho-syntactic operations that regulate whether and where the subject is projected and 2. the specific selection of facts that determine the modal base in each sentence.<sup>19</sup> I assume, specifically, that there are at least three instantiations of the skeleton that differ w.r.t how the external argument is projected: 1. a control structure (cf. 18a<sup>20</sup>) for ability adjectives or adverbials as *be able*, *be capable* or *possible for*), 2. a raising structure for *opportunity-can*<sup>21</sup> (18b) and 3. a structure where the external argument of the main predicate is demoted, i.e. syntactically not generated in the specifier position of VoiceP (as e.g. in verbal passives, unaccusatives etc.).

<sup>18</sup>  $R_c$  can be understood as anaphor whose particular value in a given sentence is determined by the pragmatics.  
<sup>19</sup> Naturally, these two dimensions are not entirely independent but interact. E.g. if the subject is demoted the conversational background won't be able to make reference to essential properties of the subject as is needed in the prototypical case of an ability attribution "John can swim".  
<sup>20</sup> I abstract away for the moment what the projections between the VoiceP and the modal operator is.  
<sup>21</sup> see sect.2.?



### 2.1 The quantificational force

I assume that the quantificational force of the operator is existential (if it quantifies over possible worlds). That will be, of course, also true if the quantifier is expressed by *can* which has the immediate and welcome result that we don't need to assume two lexical entries for *can*, one with existential force if it takes an epistemic or deontic base and one with generic/quasi-universal or even universal force if it is *abilitative-can*. Another argument in support of this assumption comes from the account of the lack of duality where I argue that there is a principled reason why a universal modal can't be used to ascribe an ability. Furthermore, I'll argue in section 4.2 that the strength for the quantificational force shifts with assumed standards of proficiency for abilities. Hence a pragmatic solution to the question about the quantificational strength of the operator is appropriate rather than semantic one. On the other hand, I show in (4.3) that for the special case where *can* takes a circumstantial base there is a close relationship between generic quantification over situations and existential quantification over worlds. I'd like to suggest specifically, in the spirit of Kratzer (1989), that they are two sides of the same coin: "non-accidental generalizations" of a world. Since universal force wouldn't permit bridging this gap and there is evidence in favor of this hypothesis, (licensing of free choice any, counterfactual reasoning, excluded middle,<sup>22</sup>) we have another argument favoring the assumption that the operator comes with existential force.

### 2.2 The "circumstantial" modal base

As already briefly mentioned in section 1, I follow Kratzer's assumption that a circumstantial base is at the heart of AAs. Recall, that a circumstantial base is characterized, informally, as conversational background function that looks into the world of evaluation, selects a set of facts of that world and returns a set of worlds all of which have the property that the selected facts of the world of evaluation are facts in these worlds too. Given this construction, it follows immediately that world of evaluation is an element of the restrictor set as well. In fact, if the

<sup>22</sup>Because of space and time limitations, I can't discuss these phenomena in detail in this paper. They are mentioned at the end of the paper to give a promising outlook for the proposal.

modal base is unordered a circumstantial base, is an equivalence class, i.e. that accessibility relation that determines a circumstantial base is reflexive, symmetric and transitive. For such a model the following theorems hold (conversely, S5 which elevates the formula in (19) to axiom is characterized by a equivalence class.<sup>23</sup>)

- (19) a.  $\Box p \rightarrow p$  "what is necessarily true is true"  
 b.  $\Box p \rightarrow \Box \Box p$  "if something is necessarily true it is necessarily so"  
 c.  $\Diamond \Box p \rightarrow p$  "what is possibly necessary is true"

I take this to be the crucial property that determines to a large extent what the behavior of the modal sentence will be and where deontic, epistemic and bouletic modals differ. Specifically, I will show that a complete account for the lack of duality relies on that notion because it not only helps to explain that there is no dual for AAs but also why intended dual paraphrases switch the base to a bouletic base and thereby fail to paraphrase an AA. A second argument comes from the fact that it is this specific property of the restrictor that allows us to bridge the gap between existential quantification over worlds and (non-accidental) generic quantification over situations. The link is that a circumstantial modal base is truth-conditionally equivalent to a persistent generic operator. Both of them provide the tools to express non-accidental generalizations about a world. With this assumption, we can understand why present tense generics always seem to have a secondary meaning equivalent to an AAs as well as the parallel behavior of AAs and some present tense generics already alluded to above.

### 2.3 VoiceP (the "change of state denoting" complement)

The third piece, the requirement to have a "change of state" denoting predicate under the modal operator, is the amendment I propose to Kratzer's treatment. It is fairly obvious that something of that sort has to be required to get an AA.<sup>24</sup> After all, abilities are abilities to do something, i.e. they are properties of an individual that allows him, her or it to bring about a situation of some kind. I assume with Kratzer's (1994) and many other scholars that the external argument (agents or causers) of a verbal predicate is generated in the spec of a functional head (voice) (cf. Marantz(1993), Kratzer(1994), Chomsky(1995)). Since I am right now not committed to the specifics of any of these proposals I will simply notate the phrase as "vP" or as "VoiceP".

The argument to show that a VoiceP is crucial for the semantics of AAs are two kinds: in section 2.5 I show that when there is no external argument provided by the main predicate under the modal operator, the predicate gets either coerced into an "agentive/eventive" reading or if the main predicate resist coercion, the abilitative interpretation of *can* is not available. The second argument comes again from the account for the Lack of duality where I make crucial use of VoiceP. I assume with Reinhart(1997), that the external argument can be equipped with the features [ $\pm$  cause] and [ $\pm$  intentional] where the combination [+cause/+intentional] encodes

<sup>23</sup> cf. Gamut (1991:volII:29)

<sup>24</sup> Carlson (1977) e.g. has the following remark about abilitative *can*: although the specific execution of the idea as well as the fact that consequences are quite far reaching has escaped the attention of people who think about it.

agentivity while [+cause/-intentional] represents "bare causers". I show that ability systematically can't be expressed by a universal modal *can* be understood in terms of a presupposition that arises from the subject (intentionality presupposes "having a choice") and the meaning a universal modal restricted by a circumstantial base - essentially it describes a natural law.

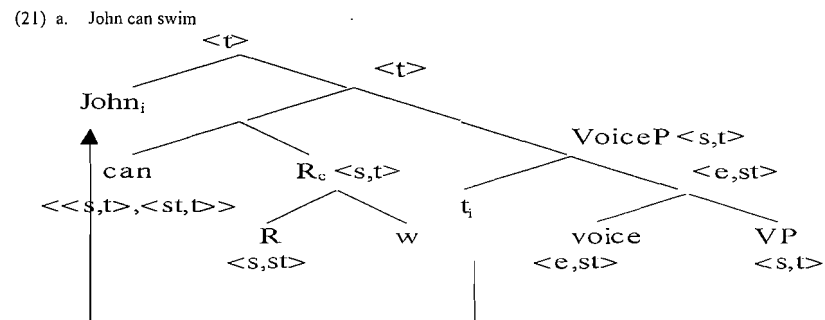
If it is indeed correct that AAs need a change of state-denoting predicate as complement, we have to assume that the relevant notion is fairly broad. Witness the example in (20) (with narrow scope of negation), which on the face of it do not denote a change of state.

- (20) a. John can NOT breath for three minutes.<sup>25</sup>

I assume that resistance against a naturally proceeding course of events that causes a situation not to occur counts nevertheless as "change of state". In general, anything that overcomes the inertia of the world counts as "change of state". This assumption might cause "ontological discomfort". However there is linguistic evidence, cf. section 3.2, that suggests that at least as far as it concerns the language faculty this assumption is right.

### 2.4 How the 3 pieces work together (a sample derivation)

To see how these three pieces work together to give the right meaning for *abilitative-can*, I give below a simplified but commented sketch of a sample derivation for "John can swim". For the purpose of this illustration I assume that the raising structure in (18b) is generated and subject is interpreted in its base position. I also assume situation semantics and existential closure to take VoiceP as argument to bind the situation variable of the main predicate. Intensional abstraction immediately above will return an abstract over worlds/situations again. (I annotated the relevant nodes with their assumed type).



<sup>25</sup> Not is stressed (carries pitch accent) when it takes narrow scope wrt. to *can* as indicated by capitalizing *not*.

I take this structure to be the null-hypothesis. The subject is generated in the specifier of vP where it gets its theta-role. As for the semantics of VoiceP, I follow Kratzer (1994) proposal. The main verb denotes a set of events or situations (22a), the cause-head is of  $\langle e, st \rangle$  cf. (22b) and combines with the main predicate via a special composition rule "event-identification" to yield a predicate of individual-event pairs (22c). This in turn combines with the subject by functional application (22d).

- (22) a.  $[[swim]] = \lambda s \in E. s$  is a swimming-event/situation  
 b.  $[[voice]] = \lambda x \in D. \lambda s \in W. x$  brings about a situation/event  $s$   
 c.  $[[voice\ swim]] = \lambda x \in D. \lambda s \in E. x$  brings about a situation  $s$  which is a swimming-event  
 d.  $[[John\ voice\ swim]] = \lambda s \in E. John$  brings about a situation  $s$  which is a swimming-event

Existential closure ( $\exists_c$ ), which I assume to be restricted by a default argument [ $s$  is part of  $s'$ ] will then bind the open situation argument to give the following denotation (23b). Unless the situation variable  $s'$  of the default restrictor is bound by a higher operator, it will get a default interpretation as referring to the utterance situation. Thus, informally speaking, *John swims* is true iff there is a situation (typically the utterance situation) that includes a situation  $s$  which is a swimming situation by John.<sup>26</sup>

- (23) a.  $[[\exists_c]] = \lambda P_{\langle s, t \rangle}. \lambda Q_{\langle s, t \rangle}. \text{there is at least one } s \text{ st. } [s \text{ is part of } s'] [Q(s) = 1]$   
 b.  $[[\exists_c\ John\ voice\ swim]] = 1$  iff there is at least one  $s$  [ $s$  is part of  $s'$  &  $s$  is a swimming-event of John]

*Can* is analyzed as propositional operator that relates sets of possible worlds ( $\langle s, t \rangle$ ). The lexical entry for *can* is then as in (24a). The restrictor is given by a conversational background function that takes a world as argument and returns a set of worlds. In the case of *ability-can*,  $R_c$  will return a set of worlds such that John's counterpart in those worlds) has a property responsible for the ability to swim (e.g. some specific state of mind/brain, we can call it "Pswim").<sup>27</sup>

- (24) a.  $[[can]] = \lambda P_{\langle s, t \rangle}. \lambda Q_{\langle s, t \rangle}. \text{there is at least one } w [wRw'] \& [Q(w) = 1]$   
 b.  $[[can\ John\ swim]] = 1$  iff there is at least one  $w [wR_c w']$  & there is at least one  $s$  [ $s$  is part of  $w$  &  $s$  is a swimming-event of John]  
 "there is world among the accessible worlds in which John has Pswim and that includes a swimming event of John"

Nothing spectacular has happen so far. We have seen, how the tree pieces work together to give the core semantics for "John can swim". I haven't shown, that these components are necessary nor have I talked about how they help to solve our initial problems. This is done in the next section. Before that, I review briefly the various uses of *can*, to have a reference list against which we can check various interpretations.

<sup>26</sup> Various tricky issues about the size of this swimming situation of John arise at this point. I will abstract away from these problems for most of this paper (cf. section 5. for a few remarks)  
<sup>27</sup> Typically, this property will be conceived of as individual level property of the subject. I.e. we think of abilities as stable properties that don't come and go. See section 2.? to show that this has systematic consequences for the behavior of sentences like "John can swim".

## 2.5 The various uses of *can*

According to Kratzer, the various meanings of a modal come about because different restrictors are defined by the conversational background. Some modals seem to have lexical restrictions and preference as to what kind of modal base they can take. *Can* is compatible with various bases among them are epistemic, deontic and circumstantial as shown in the data below.

- (25) a. John can be waiting outside, (in view of the evidence available). epistemic  
 b. John can listen to punk rock, (when Mary isn't around) deontic: "allowed-to-do"<sup>28</sup>  
 c. John can be married to his cousin, according to the law. deontic: "allowed-to-be"  
 d. John can jump higher than Bill. ability  
 e. John can see Mary from where he is standing "opportunity"<sup>29</sup>

It is important to keep these different meanings apart. Sometimes it is rather difficult. Consider the difference between the epistemic readings of *can* and what I called the "opportunity" reading. At first sight, it is not obvious that there is a real difference. However, the following test seems to reliably differentiate the 2 readings<sup>30</sup>. Epistemic modals are odd (or induces an ironic effect) if it is clear that the proposition in question is true in the actual world (e.g. if there is conclusive evidence directly available for everybody participating in the conversation). Consider an utterance as in (26a) in a situation where John is in his office and the participants are looking at him in the office. Or (26b) in a situation where the participants are looking outside where it is heavily raining. While the epistemic modal is quite odd, a circumstantial *can* is perfectly fine (26c).

- (26) a. ? Hm. John must be in his office.  
 b. ?? Hm. It might rain really hard here.<sup>31</sup>  
 c. Hm. It can rain really hard here.

Controlling for deontic readings of *can* is a lot easier, to be sure a paraphrase using *allowed to* that doesn't change the meaning will proof the availability of a deontic reading. For instance, (27) can have a contradictory meaning which can arise only if there is a deontic reading available for *can*.

- (27) John can watch Star Trek but he isn't allowed to.

Another readily available means to control for alternative readings is to use the semi-modal *be able to* instead of *can*. As can be seen below, only the last two readings of *can* are compatible with *be able to* which leaves us with the 2 truly circumstantial readings for *can*: *ability-can* (25d) and "opportunity-can" (25e).

<sup>28</sup> The labels "ought-to-do" and "ought-to-be" that serve as precedence are due to Feldman (1986) acc. to Brennan (1993)

<sup>29</sup> I borrow the label "opportunity-can" from Austin (1970)

<sup>30</sup> suggested to me by Sabine Iatridou.

<sup>31</sup> Note that an epistemic modal is fine if the progressive is used and some standard of "heavy raining" is implicitly referred to as in (i).

(i) a. It must/might be raining really hard right now.

- (28) a. \* John is able to be tall (in view of the evidence available).  
 b. # John is able to listen to punk rock.  
 c. \* John is able to be married to his cousin, according to the law.  
 d. John is able to jump higher than Bill.  
 e. John is able to see Mary from where he is standing.

\* epistemic  
 \* deontic: "allowed-to-do"<sup>32</sup>  
 \* deontic: "allowed-to-be"  
 ability  
 opportunity

*Be capable of* imposes even stricter restrictions, it can be used only to express *ability*, the "opportunity" interpretation is not available. Thus (29b) has an interpretation where it is *because* of some non-accidental property of John that he can see Mary. Both semi-modals are compatible with non-intentional subjects. Other languages have even more fine grained modal expressions, in German for instance, the semi-modal "*faehig sein*" ("be capable of") requires its subject to be intentional.

- (29) a. John capable of jumping higher than Bill.  
 b. John is capable of seeing Mary from where he is standing.

ability  
 #opportunity

- (30) a. Der Hans ist faehig das Fenster zu zerbrechen  
 'John is capable of braking the window'  
 b. ?? Der Wind ist fachig das Fenster zu zerbrechen.  
 'the wind is capable of breaking the window'

A note on the terminology: For the remainder of the paper I will use *ability-can* and *ability modal* to refer to prototypical ability attributions (like John can swim) and *opportunity-can* to refer to things like (John can see Mary). I will also talk about the *dispositional* use of can. When I want to refer to the whole set without picking out one of them specifically I will use either *circumstantial modal*, (or *circumstantial can*) or *abilitative-can/ abilitative modal*, likewise unless specially noted *AA* will refer to sentences that use any one of these meanings and not just the canonical *ability-can* reading. In the next section, I give arguments to justify the skeleton for *AA* which is intended to hold for all three *abilitative modals* mentioned so far.

### 3. Justifying the semantic skeleton of AA

#### 3.1 Ability and Causation

Intuitively, having an ability means "being in control/having the potential of bringing about a situation or an event of some kind." We'll see in the next section that this intuition is reflected in the behavior of *abilitative-can*. Specifically, I'll present data to support the following descriptive generalization:

##### (31) Ability and Causation

1. If the predicate embedded under can has an external cause theta role, the ability interpretation is available.
2. If it doesn't, *can* (and *be able to*) coerces the main predicate into an "agentive" interpretation under the ability reading.
3. If the main predicate resist coercion the ability interpretation is not available.

<sup>32</sup> There is an ability reading available along the lines of "John is able to listen to punk rock, without getting nervous.

Prototypical cases of AAs with *can* have a main predicates that has an external theta-role "Agent" or "Causer". If this is not the case, *abilitative-can* tends to impose an agentive or eventive interpretation on the main predicate. (32) for instance coerces the main predicate to something like "behaves in a nervous way" and (33) is understood as "become sick".

- (32) a. John can be nervous.<sup>33</sup>  
 b. John is able to be nervous.

- (33) a. John can be sick.  
 b. John is able to be sick.

For predicates that resist that kind of coercion, we observe that the ability reading for *can* is unavailable. Since *can* has an escape hatch into an epistemic reading, the sentences are grammatical. Sentence with *be-able-to*, on the other hand, are deviant because, *be able to* does not have that option (presumably because it assigns a theta role to the subject). Individual level predicates are typical examples of the latter kind (cf.(34) and (35)).

- (34) a. John can be tall  
 b.?? John is able to be tall

- (35) a. John can belong to the McDonald clan  
 b.?? John is able to belong to the McDonald clan

Derived stative predicates like the progressive which denotes an ongoing process display essentially the same pattern (cf.36). Unaccusative verbs like *fall*, *slip*, *die*, etc. behave similarly with the exception that coercion is a lot easier, giving rise to "stage-(direction)-interpretations" (cf.37).

- (36) a. John can be sleeping all day.  
 b.?? John is able to be sleeping all day.

- (37) a. John can die like nobody else  
 b. John is able die like nobody else

Finally, passives display a very clear dichotomy that illustrates exactly the point. While verbal passives are fine under an ability modal adjectival or stative passive isn't. Thus we get only an epistemic reading for *can* and semi-modals are ungrammatical with an adjectival passive. Since the morphology in English is ambiguous between the two passives, I provide the examples in German which allows control of the passive via the choice of the auxiliary (cf(39)).

- (38) a. John can be arrested  
 b. ? John is able to be arrested

<sup>33</sup> Aside from the epistemic reading for *can* there is an additional reading for *can* that can be paraphrased as "John has a (slight) tendency to be nervous" or "John is sometimes nervous". I discuss these "quantificational variability" readings in sec. 4.2. Note, that this reading isn't available for *be able to*.



- (39) a. Der Hans kann eingesperrt werden.  
 b. Der Hans kann eingesperrt sein.  
 'John can be arrested'

*epistemic ability*  
*epistemic \*ability*

The leading intuition concerning the difference between adjectival and verbal passive, is that the former is stative while that latter is eventive. For the purpose of this paper, I assume the relevant difference to be that verbal passives still have a cause head and hence project a VoiceP while adjectival passives don't.<sup>34</sup> Note, that this doesn't mean that the specifier of VoiceP has to be projected (or filled). In fact, for all syntactic purposes the external argument in verbal passives seems to be inert (it doesn't count as interfering with case driven movement of the object and it doesn't count for case assignment).<sup>35</sup> In other words, agentivity or eventivity can be expressed without a syntactically present agent. There are, then, 2 conclusions to be drawn from these facts: To get an ability meaning for *can* the complement has to be a change of state denoting predicate (VoiceP in my simplistic rendering) but the specifier of VoiceP is not necessary. Given that, it is not too surprising that we get an ability reading for weather verbs cf.(40a).

- (40) a. It can rain in the Antarctic  
 b. \* It is able to rain in the Antarctic

But how do we know that this is actually an ability reading of *can* and not just used as epistemic modal? After all, *be-able-to* is ungrammatical with weather verbs. As mentioned in 2.5 to control for that, we need to imagine an utterance situation where all participants of the of the conversation have direct access to the truth of the proposition in question. Epistemic modals are infelicitous in such a situation while ability modals are ok. Imagine, that all participants are looking outside the window and see that it is heavily raining outside. (41a) is infelicitous while (41b) is perfectly fine. The fact, that *be-able-to* is ungrammatical shows simply that it has its own theta role to assign.

- (41) a.?? Hm. It might rain really hard here.  
 c. Hm. It can rain really hard here.

Perception verbs seem at first glance at odds with the proposed generalization because they are not inherently agentive, still they are compatible with *ability-can* and *be able to*. I follow Gruber(1967) who analyses sentences like (42a) as "John's gaze went to Mary"<sup>36</sup> which can be coerced into "John can direct his gaze so that it goes to Mary" under an ability modal. I assume that this analysis can be generalized across all perception verbs (Gruber(1967) proposed it only for *see*) so that they don't count as counterexample to the generalization.<sup>37</sup>

<sup>34</sup> A more complete account needs to consider the semantics of participial morphology. The question how participles fair with ability modals is its own research topic.

<sup>35</sup> The arguments from control are inconclusive. cf. Embick(1997) for a concise review.

<sup>36</sup> *see* is analyzed as non-agentive motion verb that has TO incorporated

<sup>37</sup> Note that perception verbs typically give rise to what I called "opportunity" interpretation of *can*. In section 3.3 I argue that that is not necessarily so, however there is a reason why they usually give rise to this interpretation.

- (42) a. John saw Mary  
 b. John can see Mary

The first part of the generalization, if the main predicate has an external theta-role the ability interpretation is always available, hardly needs special attention. It would be significant to find a counterexample, i.e. an agentive predicate that doesn't allow an ability reading, though. The closest I got to finding one are agentive predicates that are realized automatically, without volitional control of the subject, like breathing, sneezing, coughing etc. They are strange if unmodified, but adding any kind of modifier that allows reading into the utterance some kind of achievement of the subject (that is worth reporting), these sentences are fine again. (Imagine, for instance that (43a) is uttered to describe a property of a specimen of the latest generation of androids.)

- (43) a. ? John can /is able to breath  
 b. John can/is able to breath again  
 c. John can/is able to breath deeply.  
 d. John can/is able to breath air.

Another question is, whether the external theta role has to be agent (which I assume to be a shortcut for the presence of the two features +cause/+intentional<sup>38</sup>) or whether cause alone is sufficient for AAs. The obvious way to test that question is using animate and inanimate, intentional and non-intentional subjects with *ability-can*.

- (44) a. Yeast can/is able to produce penicillin  
 b. The sting of a honey bee can/is able to kill someone who is allergic to that venom.  
 c. A tomado can/is able to destroy a hole town.  
 d. Bribing can/\*is able to get you into jail.

Since both inanimate and non-intentional animates subjects are compatible with the ability interpretation, we can safely conclude that only causation is necessary for AAs. The causer doesn't have to be an individual, it can also be an event (loosely speaking) cf. (44d). Summing up the evidence collected in this section, I conclude that AAs have the following property.<sup>39</sup>

(45) **Causation Generalization**

The subject of the AA has to be the causer of the event that the main predicate describes.

<sup>38</sup> cf. Reinhardt (1997)

<sup>39</sup> For the Causation Generalization to hold in full generality, I have to assume that every coming about of a situation has a causing event/situation. Strictly speaking and assuming a notion of Minimality for situations (cf. Heim(1990), von Stechow 1996, etc.), the generalization should be stated as follows:

**Causation Generalization (strict version)**

The subject of the AA has to be part of the minimal causing situation of the event described by the main predicate.

Note that this allows locations to be the subject of AAs. See sec. 3.2 for a discussion. An alternative to assuming such a broad notion of causation, would be to distinguish events/situations that are caused from events/situations that occur (without any identifiable causing event preceding it). Such a story would be particularly interesting, if there is a natural way of deriving *causation* from *occurring* (or the other way round) and we could find languages that instantiate such an operation with overt morphology. (Participial morphology comes immediately to mind.)

From this generalization it follows, that main predicates that don't have causing situations (because they are stubbornly stative and can't be the complement of VoiceP) can't be used in AAs. Hence, adjectival passives and all predicates that resist coercion into an eventive reading are incompatible with ability modals.

What about verbal passives? From the causation generalization it follows that the surface syntactic subject can't be the subject of the AA because the theme of the event described by the main predicate is not its causer.<sup>40</sup> Hence, the subject of AAs with verbal passives is implicit, (e.g. the police in (39)).

The next question that arises is whether there has to be a causer to get an AA or if the causing of a situation described by the main predicate alone is sufficient. I think that the latter is correct although it is misleading to call such a construction an AA. In fact, I'd like to suggest, that when a modal operator with existential force restricted by a circumstantial base takes a complement that doesn't have an (implicit or syntactically realized) causer, we get the semantics of dispositional predicates. The bottom line, then, is that the complement of an *ability modal* (by this I mean to include dispositional readings as well) has to denote "the causing of a situation of some kind". If the complement doesn't satisfy this restriction, the ability/disposition interpretation is not available. Hence a more general way of stating the causation generalization would as follows:

(46) **Causation Generalization** (more general version)

An modal operator restricted by a circumstantial base that has existential force is compatible only with a "change of state denoting complement".<sup>41</sup>

What about a modal operator with universal force that is restricted by a circumstantial base? Before I consider, whether the causation generalization holds in these cases too, let me examine briefly what the meaning in principle is. In (47) are examples that display more or less openly the special meaning that results in that case: a description of a natural law.

<sup>40</sup> Note that, in order to capture that, the causing situation mentioned in the strict version of the causation generalization in the previous fn. has to exclude the theme.

<sup>41</sup> Why should that be so? I think that it is not because of an arbitrary restriction given by UG. Rather, I'd like to suggest that the causation generalization is a reflection of the properties of the modal base that modal operator in AAs takes. Recall that the modal base of AAs (if unordered) is an equivalence class of worlds that includes necessarily the world of evaluation. Stable stative predicates hold tentatively throughout (the relevant portion of) the history of the world of evaluation. I.e. they almost defining properties of the world or in Kratzer's (1989) terminology they are "lumped" by any proposition that is true of a situation inside the world of evaluation. Since the modal base is an equivalence class, stable statives that are true in the world of evaluation hold in all worlds in the base. In other words, the state described by a stative predicate is either true in all worlds of the base or false in all of them. A universal operator would be redundant while an existential operator would be not just "too weak" (a violation of the Gricean principle of being maximally informative) but actually misleading in that it suggest that there are worlds in the base for which the state is true and ones for which the state is false. However, if it is not clear which world of the ones compatible with the *knowledge* of the speaker is the actual one, an existential operator is fine. It would mean something like: There is a world in the set of worlds compatible with knowledge of the speaker that in which the stative predicate holds. In more intuitive terms, a universal modal operator restricted by a circumstantial base means something like "must occur" given a certain state of affairs while the latter means "can occur". However, "must also be" or "can also be" given a certain state of affairs is always epistemic.

- (47) a. John is driving a car from London to Paris. On its way, he must pass through the Euro-Tunnel.  
b. By the Law of Gravity, an object unsupported in mid air will fall to the ground.<sup>42</sup>

Note, that the unaccusative verb *fall* seems to occur perfectly natural under the universal modal, as witnessed by the failure of the classic tests for agentivity (48). It seems, then that the causation generalization doesn't hold for universal modals restricted by a circumstantial base (even though stable stative complements induce an epistemic reading of the modal (see fn. 38 for a rationale)

- (48) a. John being unsupported in mid air, must fall ??deliberately, ??on purpose, ??in order to respect the Law of Gravity to the ground.  
b. John can fall deliberately/on purpose/ in order to impress the his friends.

I think, the fact that a universal modal operator restricted by a circumstantial base essentially describes an (instantiation of a) natural law (recall Kratzer's wording "the necessities implied by given state of affairs") carries the key to understanding why AAs lack a dual, more precisely why a universal modal operator together with negation can't be used to give a paraphrase of an AA.

### 3.2 On the Lack of Duality in AAs

Recall the problem from section (1). In general, for a given modal base existential modal force can be expressed in terms of universal force together with negation and vice versa. AA seem to be an exception to this generalization.

- (49) a. You must be quiet  
b. You may not be not quiet
- (50) a. John can swim.  
b. John need not not swim.  
c. It is not the case that John must not swim.  
d. John can't swim  
b. John must not swim

Note that the lack of duality doesn't appear to be an accidental property, e.g. tied to modal verbs since we observe the same pattern with modal adverbials cf (51). Nor can it be because negation couldn't take scope under the ability modal. Finally, it is not tied to a particular language, in fact all the languages I have looked so far<sup>43</sup> observe the generalization in (52)

- (51) a. It is possible for John to swim.  
b. It is not necessary for John not to swim.
- (52) **Ability Modal Generalization** (preliminary version)  
If a language uses a modal auxiliary to express ability then it is always an existential modal and never a universal modal.<sup>44</sup>

<sup>42</sup> Note the distinct predictive (future oriented) flavor of these statements. I think that this is basically for the same reason that makes stable statives odd under a universal modal.

<sup>43</sup> English, German, Dutch, French, Italian, Greek, Bulgarian, Hindi.

<sup>44</sup> Many languages use imperfective morphology to express ability which is usually analyzed as generic operator. I argue in the last part of the paper that this is not a counterexample but in fact confirms it.

If (52) turns out to be right, there has to be a systematic explanation. The first suspicion, that comes to mind, is that *abilitative-can* simply doesn't have a twin because there is something inherently inconsistent with a "universal ability" (by which I don't mean omni potency even though the label suggests that). I think that the suspicion is right on track, however it is instructive to see where exactly the inconsistency arises. In particular, it can't be because the skeleton of AA wouldn't allow a universal as we have already seen in the previous section. So the question is, why can't we use a universal in place of the existential operator do give a dual paraphrase. The case that displays this fact most directly is that we can express an inability not to do something using an existential modal operator but not by using a universal modal (which should be truth-conditionally equivalent).

- (53) a. G: Danny, you have to stop smoking. You'll get lung cancer, if you don't!  
 b. D: It's too hard. I can't refrain from smoking/not smoke!  
 c. D: # It's too hard. I must smoke.<sup>45</sup>

This fact constrains possible accounts for the lack of duality considerably. For instance, an account in terms of relative scope of modal operator and negation (and possibly some other hidden operator) seems rather difficult to maintain, the problem arises very locally.

Does that mean, that universal force is in principal incompatible with a the base of AA modals? Obviously not, as we have seen already. But it gives a meaning that describes essentially a (natural) law-like statement. Given certain circumstances in the world of evaluation it is necessary that other facts hold there and in all worlds that are accessible given these facts, too.

I'd like to suggest the reason why intended dual paraphrase fail is because regularities that are describable as natural laws are incompatible with the notion of an intentional agent. I.e. the conceptualization of intentional agents implies having the choice of whether the agent does some thing or doesn't. I assume then, that the feature [+intentional] comes with a presupposition of "having a choice" which is inconsistent with a universal modal operator that is restricted by a circumstantial base. Indeed, forcing an intentional interpretation of subject by using verbs like *kick* the intuition that is very sharp cf (54a,b).

- (54) a. The goalie can kick the ball to the opposite end of the field  
 b. The goalie must kick the ball to the opposite end of the field

The way out of this predicament is to change the modal base minimally so that it is compatible with both universal force and an intentional causer.<sup>46</sup> The obvious way to do that is to introduce an ordering on the modal base. Which seems to be exactly how intended dual paraphrases fail. I.e. the universal modal operator that we get and that is commonly alleged to be the twin of

<sup>45</sup> The example is due to Danny Fox (pc) Note that "It's too hard. I *have to* smoke." is fine. (Sabine Iatridou pc.)

<sup>46</sup> It might be worth pointing out that the argumentation is at this level purely linguistic in the sense that natural language and in particular pragmatics seems to force a conceptualization of agentivity along the lines suggested. That doesn't automatically imply a stand on philosophical discussions on e.g. determinism, "free will", weather god can violate natural laws and other such monsters which is the usual context in which the notion "ability" is discussed in philosophy (cf. Austin, Moore,...).

*abilitative-can* is *dispositional must*<sup>47</sup> whose base is *bouletic* and not as we would demand for a dual to *abilitative-can* circumstantial. A bouletic base can be most easily described by purpose clauses. (John sneezes in order to get ride of the itch in his nose.) This base is similar to a circumstantial base in that it looks at some specific facts of the world of evaluation and returns a set of worlds typically (and here is the crucial difference) the world of evaluation is not included in this set. E.g. John sneezing in (55) is intended to relieve him of the itch. I.e. the itching nose is a crucial fact in the world of evaluation and which is excluded from the modal base since the sneezing is intended to relieve the itch.

- (55) a. John must sneeze all the time  
 $\forall w' [\max(wR,w)] [\text{John sneezes in } w']$

"Max" will impose an ordering on the set of circumstantially accessible worlds and order them according to how well they conform to his desire in *w* to have a non-itching nose. Note, that that doesn't mean, that after he sneezes that is going to be in an ideal world wrt. itchy noses. If he is not, he'll probably sneeze again. Furthermore, it doesn't mean, that the circumstantial base couldn't be ordered in some other way for *abilitative-can*. The important difference seems to be that a bouletic base excludes (typically) the world of evaluation from the modal base while it is necessarily included for *abilitative-can*. The test to show that *dispositional must* is inherently bouletic is to use an if-clause continuation that questions the subjects desire. Note that the sentence is distinctly odd while *abilitative can* is perfectly fine (modulo the compatibility of reflex-like activities like sneeze with *ability-can*).

- (56) a.?? John must sneeze if he wants to  
 b. The can sneeze if he wants to  
 c.?? The goalie must kick the ball to the opposite end of the field if he wants to.<sup>48</sup>  
 d. The goalie can kick the ball to the opposite end of the field

Conversely, if it is correct, that the problem arises because of a presupposition projected by the feature [+intentional] we'd expect that for [-intentional] subjects, the judgment on duality to be different. I.e. it should be a easier if not completely fine to construct a dual paraphrase to an AA. This is, I think, exactly what we see (e.g. (57))<sup>49,50</sup>

- (57) a. Yeast can produce penicillin  
 b. Yeast must produce penicillin  
 c. It's not the case that yeast must not produce penicillin

<sup>47</sup> cf. Palmer(1986) or Lyons(197?), Brennan(1993)

<sup>48</sup> Actually, the sentence seems fine if the goalie suffers from a minor personality disorder by which he *has to* act upon each wanting state that occurs in his mind - that's exactly what *dispositional must* means when the change of state described in the complement is not reflex-like.

<sup>49</sup> It might be that we can find a reason along these lines for the behavior of have-to as well (cf. fn28)

<sup>50</sup> Note that *dispositional must* is odd with [-intentional] subjects (almost by definition) which supports the interpretation I gave why duality holds with [-intentional] subjects while it doesn't with [+intentional] subjects.

This is definitely encouraging, but it also means that the Ability Modal Generalization given in (52) is strictly speaking not valid. However, it is still true that we should find the suspected asymmetry for modals that have lexical restriction as what kinds of subjects they can take.

- (58) **Ability Modal Generalization** (final version)  
If a language uses a modal auxiliary to express ability and that modal allows only [+intentional] subjects then it is always an existential modal and never a universal modal.

This means that the generalization is in its actual coverage a lot weaker than expected, still there are relevant cases like the German modal operator "faehig sein" (*be capable of*<sup>51</sup>). Furthermore, it suggests an implicational generalization along the following lines of (59). The reasoning behind it is of course that AA with [-intentional] subjects are a (probably rather small) subset of all AA.

- (59) **Ability Modal Implicational Generalization**  
If a language uses a modal auxiliary to express ability and it allows universal modals to do that it will also have an existential modal that can be used to express AAs.

Let me summarize: The basic semantics of AAs was given in terms of existential quantification over worlds restricted by a circumstantial modal base. We also saw that AAs have an additional constraint: the predicate below the modal has to denote a change of state. Furthermore, if the AA has a subject it also has to be the causer of the main predicate used in the AA. (If there is no subject, the construction expresses a dispositional generalization.) With these two pieces, together with a natural assumptions about the pragmatics of intentional agents, we can explain the (apparent) lack of duality in AA, which seem to be a challenge for a Kratzer-style analysis of *abilitative-can* as existential quantifier. Lack of duality occurs when the subject is [+intentional] and this is so because intentionality presupposes "having a choice" which is incompatible with the meaning generated by a universal modal restricted a circumstantial base. The closest one can get with an intended universal dual and an intentional subject is bouletic modality which seems to be an accurate description of how an intended dual paraphrase fails.

Overall, Kratzer's framework comes out of this discussion strengthened rather than weakened since it provided almost all the tools necessary to explain the set of facts lying behind the "lack of duality" issue. Only one piece had to be added which seemed to fit quite nicely: the "causation generalization" on AAs. As it stands, we have collected arguments for all three pieces of the skeleton of AAs: We saw that *abilitative-can* behaves like any other modal operator once the special properties of the restrictor are taken into account, we saw that it *abilitative-can* can't have universal force over worlds (it is compatible with intentional subjects) and it takes a complement of the denotes "a change of state". Furthermore, we saw evidence that modal of *abilitative-can* is indeed circumstantial. Aside from giving an accurate description of the meaning of AAs it made it possible to account for the range of facts associated with duality in AA.

<sup>51</sup> *be capable of* seems a little less strict about taking non-intentional subjects, especially when it is nominalized.

In the next section, I show that the differences between the various ability meanings (true *ability-can*, *opportunity-can* and *dispositional predicates*) which I assumed to be instantiations of the same basic frame in this section can be adequately captured once we take into account the properties of specific set of facts that end up in the modal base. There will be two main conclusions: 1. the set of facts that end up defining the modal can be quite arbitrarily selected (hence the conversational background is the right tool to use) but 2. for a given choice the syntactic and semantic behavior of the sentence is predictable.

### 3.3 Abilities, Opportunities and Dispositions

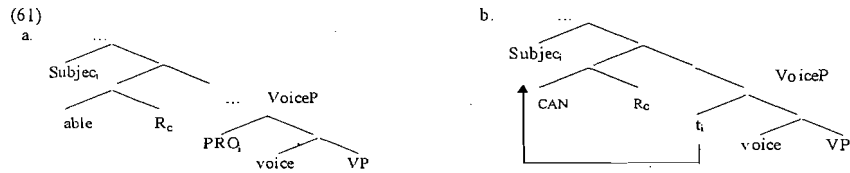
Recall that *can* seems to have a variety of meanings even if it is framed in the AA skeleton. In the previous section I suggested that these are instantiations of the same semantic core. To live up to that promise, I have to show that we can account for the obvious differences between these sentences without giving up the skeleton. There are basically 2 places in the skeleton than can vary: 1. Whether or not the specifier of VoiceP is projected and 2. The set of facts that is chosen by the conversational background to determine the modal base. Hence the meaning differences have to result from one of the two or from both. Before I go on to show that this indeed all we need to have an appropriate way of looking at these meaning differences, I should mention what the difference between *ability-can*, *be able to* and *be capable of* is. In contrast to *ability-can*, the range of meanings for *be able to* is smaller and even smaller for *be capable of*. Some of the data collected so far are repeated below.

- (60) a. John can /is able to/ is capable of swim(ing)  
b. John can /is able to /#capable of see(ing) Mary  
c. John can /#is able to /#capable of be(ing) arrested tomorrow.  
d. The symphony can /\*is able to /\*capable of be(ing) played by the orchestra.  
e. It can /\*is able to /\*is capable of rain(ing) here.

The first obvious observation to make is that while *be able to* and *be capable of* have their own theta role to assign, *ability-can* doesn't seem to have one at least in some of its uses. I.e. *ability-can* allows moving the object of the main predicate into its specifier position while both the other two don't. (60c) for instance is grammatical with the semi-modals only to the extent to which the sentence can be coerced into a reading along the lines of "John is capable of affecting the world in such a way that his arrest results tomorrow. Since (60d) doesn't permit that kind of coercion (unless the symphony is imagined to be animated and agentive) it is as expected ungrammatical. Similarly, *ability-can* tolerates an expletive subject which neither *be able to* nor *be capable of* do (60e). I take these facts to indicate that *be able to* and *be capable of* have their own theta role to assign and that the AA skeleton is instantiated in terms of a control structure.<sup>52</sup>

<sup>52</sup> Note that I remain uncommitted as to what the projections between VoiceP and the modal projection is. I suspect that it is not an accident that the complement is either a to-infinitival (which is also true for the complement of the noun ability) or a gerund but not a finite CP. (Chierchia1984, Portner1992)

Since *abilitative-can* behaves notably different in these respects the null-hypothesis is that it doesn't have a control structure but a raising structure.<sup>53</sup>



There is also a difference between *be able to* and *be capable of* as indicated in (60b). The dominant reading of (60b) for *can* and *be able to* is the "opportunity interpretation" which is apparently not available for *be capable of*. As noted above, I borrow label "opportunity-can" from Austin(1970) who noted the distinction between an abilitative use of *can* and *opportunity-can*. He observed a third meaning of *can* typically occurring under the scope of past tense labeled the "all-in sense" of *can*. The "all-in" *can* can be described, as Nowell-Smith (1967) pointed out, as conjoining *ability-* and *opportunity-can*, i.e. it ascribes to the subject that he/she has both the ability and the opportunity to do something.

Within the framework assumed so far the obvious way to describe the meaning differences is to assume that the conversational background selects different kinds of facts in each case.

<sup>53</sup> see e.g. Wurmbrand (1997) for arguments that restructuring verbs (modal verbs being the classic case of a restructuring verb) don't involve control.

(62) a. **Ability**

c. "All-in"

The relevant facts that determine the modal base are stable properties of the subject of the AAs in the world of evaluation. These properties (e.g. physical strength or skills) are ultimately responsible for an individual to have an ability.<sup>54</sup>

b. **Opportunity-Can**

The relevant facts are not properties of the subject of the AA. Typically they are accidental or stable properties of the utterance situation

Both, facts about the subject as well as about the utterance/reference situation determine the base. If it is truthfully used, it means that the subject has the ability to do x and the situation satisfies all felicity conditions to do it.<sup>55</sup>

The next section is devoted to showing that the choice of facts that determine the modal base is linguistically significant as well, i.e. the different readings display different syntactic behavior in certain contexts.

### 3.3.1. "physical abilities" vs. "mental abilities" (skills),...

*Ability* is a cover term for a variety of properties that allow an individual to bring about some kind of situation. There are languages that use different lexical items depending on the nature of the property responsible for the ability. Many romance languages, for instance, as well as Greek and Bulgarian use an existential modal if the property in question is physical strength while they use the word for /know/ if the property in question is a property of the mind (e.g. a skill). This explains the at first sight puzzling contrast between e.g. French that chooses different lexical items and English (or German) that doesn't.<sup>56</sup> (63a) can't be used to ascribe the subject the skill that allows him to swim, (at first sight) it only has a deontic or epistemic meaning. Instead, /know/ has to be used.

(63) a. # Jean peut nager  
'Jean can swim'

b. J. sait nager  
'Jean knows swimming'

Interestingly enough, once a VP modifier like "across Loch Ness" is added, "can" appears again and "know" seems odd now. However, if the context is set up so that "swimming across Loch Ness" is understood as maze like of problem: e.g. in order to accomplish swimming across Loch

<sup>54</sup> I assume that skills, and knowledge are (just) properties of the mind/brain. I.e. for somebody to have a skill his mind/brain has to be in a certain state. If we had the means to identify and detect the presence of e.g. "knowing how to play tic tac toe" we could verify a tic tac toe AA without getting into conditional or counterfactual puzzles. In other words, this view of abilities is entirely extensional at the ontological level which of course doesn't imply that the linguistic means to talk about abilities are extensional as well.

<sup>55</sup> Note, that this in itself doesn't entail that the subject did x (actuality entailment). There has to be still another component when we get that. Bhatt (1997) shows that perfective morphology is used in many languages to accomplish that.

<sup>56</sup> Historically, the German equivalent to *can* (koennen) is clearly related to *kennen* (know). *can* presumably is related to the same root as know. It seems that during the transition from a main verb to a modal use, *can* collapsed the distinction between reference to skills as opposed to physical strength. (Thanks to Sabine Iatridou for helping me clarify these issues.)

Ness one has to first swim 500 feet to the south to avoid the crocodiles and then 300 feet south-east to avoid the sharks and finally one has to swim 10 times in a circle to confuse Nessy before one can finish the trip. Similarly, (63a) can be used to ascribe ability in a situation in which John's broken leg has healed enough so that he can swim again. This context dependency is exactly what we expect under the analysis put forward by Kratzer and adopted here and therefore constitutes supporting evidence.

(64) a. Jean peut nager traverse du Loch Ness.

'Jean can swim across Loch Ness'

b. # Jean sait nager traverse du Loch Ness.

'Jean knows swimming across Loch Ness'

### 3.3.2 *Ability-can* behaves like an individual-level (IL-) predicate

Intuitively, we conceive of abilities as stable properties of individuals. (62a) attributes this to the fact that the modal base of the quantifier is determined by an accessibility relation that looks at individual level properties which are true of the subject in the world of evaluation. Linguistic evidence that supports this claim is given below. The main point is that *ability-can* behaves essentially like an individual level predicate. Conversely, if the relevant facts determining the modal base are accidental properties (which gives rise to "*opportunity-can*") the sentences behave like episodic sentences. Furthermore, I contrast *ability-can* with other modals and specifically *opportunity-can* to document that it is indeed a special property of *ability-can* that it behaves like an IL-predicate. I use the standard tests for IL-status (cf. Carlson(1977), Carlson(1989), Kratzer(1988), Chierchia (1995) and Carlson et al(1995)) to show that *abilitative-can* in general behaves like an IL-predicate. For reasons of convenience and because most accounts of the behavior of IL-predicates are offsprings of Kratzer's (1988) suggestion, I comment each test briefly in terms of her account. The basic idea is that stage level predicates provide a Davidsonian argument slot, (to be filled by a variable that ranges over spatio-temporal chunks) that is available for binding from outside. while individual level predicates don't.

#### 1. Locatives

IL-predicates are known to be incompatible with spatio-temporal modifiers as shown in (65). Since locative modifiers need a situation variable to modify (they are predicates of situations) they are only compatible with SL-predicates.

(65) a. John speaks French in the car

b. ?? John knows French in the car

c. ?? John is a linguist in the car

If we submit modal sentences to this test, we observe the following asymmetry.<sup>57</sup> *Ability-can* is odd just like IL-predicates are odd while other modalities (deontic, epistemic,...) are compatible with locative modifiers and *opportunity-can* behaves just like other modals in this respect (66c).

- (66) a. # In Los Angeles, John can/is able to swim (if he gets the opportunity)  
 b. In Los Angeles, John may/might/must/had to swim  
 c. In Los Angeles, John can swim, (that is if he can/has the ability to swim.)

## 2. Quantificational Adverbs

Another environment known to be sensitive to the IL/stage-level distinction are quantificational adverbs. Specifically, Q-adverbs are odd with IL predicates, unless there is another variable the Q-adverb can bind. The ungrammaticality, according to Kratzer, is due to a violation of a constraint against vacuous quantification.

- (67) a.?? John always knows French.  
 d. John always speaks French

Modals generally are compatible with Q-adverbs with the notable exception of *ability-can*. (68a) is in the same way funny as (67a). To the extent to which a deontic reading or the opportunity reading is available for *can* it is fine. (68b) is prima facie not unexpected since 'swim' is a SL-predicate adverbial quantification ranging over the Davidsonian argument should be possible. Only once swim combines with *ability-can* this variable is not available anymore which makes (68a) odd. (68c-d) show that the other modals don't display this restriction and that there is no independent reason such as Q-adverbs can't intervene between modals and the subject for (68a) to be odd.

- (68) a. # John always can swim  
 b. John can always swim  
 c. John (always) must (always) swim  
 d. John (always) may (always) swim  
 e. John (always) will (always) swim

## 3. When-clauses and If-clauses

When-clauses are typically analyzed as restrictor of a Q-adverbs, which if it happens to be phonetically empty comes with universal force ("silent always"). Consequently, if there is no variable available to be bound by the Q-adverb, the sentence violates the just mentioned constraint against vacuous quantification.<sup>58</sup> If-clauses on the other hand may also and typically do restrict a silent modal operator in which case there is no vacuous binding violation. Therefore (69c) is fine. Whatever explains the contrast<sup>59</sup>, for the present purposes it is sufficient to check

<sup>57</sup> Preposing the locative is necessary to ensure that it doesn't modify the main predicate. The pound sign of (66a) indicates that the ability reading is not available.

<sup>58</sup> There is an additional constrain on when-clauses namely the variable has to range over more than one situation. cf. De Swart (1992)

<sup>59</sup> see Hackl in prep. for a proposal.

whether *ability-can* displays the same restriction - which it does (70a) while *opportunity-can* is again fine inside a when clause (70d).

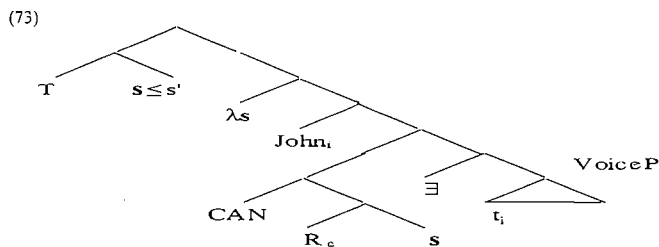
- (69) a.?? When John knows French, he knows it well  
 b. When Jon speaks French, he speaks it well  
 c. If John knows French, he knows it well  
 (70) a.?? When Mary is able to speak French she speaks it well  
 b. When Mary has to/is allowed to/has the possibility to speak French she speaks it well  
 c. When we reach the hill top we are able to see the ocean.  
 d. If Mary is able to speak French she speaks it well  
 e. Whenever John is able to /can see Mary he looks at her

## 4. The Absolute-Construction

The absolute construction (Stump 1985) seems to provide a solid test for IL-status. The crucial observation is that (71b) can mean "If John stands on a chair, he can touch the ceiling" while (71a) cannot have the parallel meaning "If John has long arms, he can touch the ceiling". Again we observe that the ability-modal in (72a) behaves like the IL-predicate while other modals don't.

- (71) a. Having unusually long arms, John can touch the ceiling  
 b. Standing on a chair, John can touch the ceiling  
 (72) a. Being able to be honest/having the ability to act honestly, John will pass the lie-detector  
 b. Being obliged/forced/having the obligation to act honestly, John will pass the lie-detector  
 c. Being allowed to/having the permission to act honestly, John will pass the lie-detector

Let's halt for a second and consider how we can formally account for the fact that ability-modals behave like IL-predicates while opportunity reading they don't. Following Kratzer's suggestion, the null-hypothesis is that in the former case there is no situation variable available for binding from outside while in the latter there is. Given the assumptions about the basic semantics of simple and of modalized sentences as in the sample derivation in 2.4 there is only one possibility for having a situation argument being bound from outside: the situation argument of the accessibility relation. (note that I assume tense (T) to be a quantificational in the sense that it relates two sets of situations, the first is given by the default restrictor "s≤s'" (s is part of s') the second is given by intensional abstraction over the proposition. The situation variables that are bound by T are in bold face in the tree below)



The derivation of the opportunity reading proceeds smoothly. Here is what the LF for a typical case for (74a) would (sort of) look like (74b). In (74c) I give an informal statement of the truth-conditions and below a possible set of facts that would be an appropriate choice to determine the modal base.

- (74) a. John could touch Mary from where he is standing  
 b. *PAST* s [CAN [s'R<sub>s</sub>] [John touches Mary in s']] & [s is John's location]  
 c. there is a situation/time s before now s.t. John is located in s and among the set of (from this situations s) circumstantially accessible worlds there is a situation s' s.t. John touches Mary in s'.  
 d. modal base = {s': the location of John and Mary in s' is as in s}

Note that the (boldfaced) situation argument *has* to be there, otherwise the accessibility relation wouldn't return a set of worlds. Hence, it can't be as Kratzer hypothesized for lexical IL-predicates that the reason why spatio-temporal modifiers are infelicitous with ability modals that there is no variable available for binding. Therefore, something else must be responsible for ability modals to behave like IL-predicates. This is an existence proof that there has to be an alternative story at least for some cases of IL-behavior. It can and should be used, in my view to go back and assume contrary to Kratzer's original claim that all predicates have a Davidsonian argument position, some come along with specific felicity requirements that exclude specifically spatio-temporal modification.<sup>60</sup> I'd like to follow Percus (1997) who gives essentially a presuppositional account along the following lines. (Since I am at this point not concerned with the exact execution, I give a more informal rendering of the basic idea)<sup>61</sup>

- (75) a. **Stable Stative Predicates**  
 p is a stable property of a situation if it follows that if p(s)=1 then p(s')=1 for all relevant<sup>62</sup> s' that spatio-temporally contain s
- b. **Felicity condition on using spatio-temporal modification**  
 It is infelicitous to spatio-temporally modify a situation s in a context from which it follows that if p(s)=1 then p(s')=1 where s' spatio-temporally contains s.

<sup>60</sup> Chierchia (1995) suggest a story similar to Percus (1997) albeit somewhat disguised.  
<sup>61</sup> See Percus (1997) p. 58 for the exact definition which talks only about temporal intervals. My informal rendering of Percus' idea is meant as preview to section 4.  
<sup>62</sup> "relevant" means in at least for some cases a reasonably big time interval. Standards for how big it has to be vary with the predicate.

Assuming as we did above that the accessibility relation that determines the modal base for ability modals looks at IL-properties of the subject of the AAs, the whole modal structure inherits the felicity conditions from these IL-properties (via presupposition projection). Therefore, we expect IL-behavior with ability modals.

As soon as the conversational background of the modal considers also episodic properties of the world of evaluation, spatio-temporal modification is possible again. In fact, in most cases, the modal base will probably be a mixture of stable stative properties of the world of evaluation as well as episodic ones, presumably not irrelevant facts but already met felicity conditions for bringing about the situation in question. (i.e. Austin's "all-in" sense)<sup>63</sup> Even properties of the object of the main predicate will end up there as long as they are considered relevant to bringing about the situation in question. Consider

- (76) a. The sonata can be finally played to the end by the musician  
 ... because the composer finished it  
 ... because the musician mastered it completely  
 ... both  
 ... because the audience stopped throwing tomatoes on the stage, ...

Are there any constraints at all what kinds of facts end up in the restrictor? More importantly, are there linguistic means to constrain and/or to indicate what the speaker considers relevant? I think the answer is yes. For instance, topic focus articulation seems to interact with it as can be seen by the simple fact that focus (realized as PITCH accent) determines the presuppositional structure of a sentence. However, it is not obvious as Chierchia (1995) observed that focus changes the truth conditions as it does in the case of adverbial quantifiers.

- (77) a. JOHN can beat Bill  
 presupposition: Someone can beat Bill  
 b. John can beat BILL  
 presupposition: John can beat Someone

<sup>63</sup> A note on Actuality entailments with ability modals

It has been noted that in the literature that sometimes ability modals come with an actuality entailment if they are in the scope of past tense.<sup>63</sup> Bhatt (1997) collected evidence showing that there is a cross linguistic generalization to be made: ability modals under past tense together with perfective aspect induce a -as he calls it- actuality entailment. The examples below are taken from his work.

- (i) a. John could eat more apples than Bill in those days  
 b. John could/was able to eat more apples than Bill yesterday *past ability*  
 c. John has been able to eat more apples than Bill yesterday. *past opportunity*  
 "all-in"

(ia) gives the regular AA that doesn't have any actuality entailment. (ib) has at least a strong preference for a reading that comes with an actuality entailment (if he didn't, or it is not clear whether he did, *could have eaten* would be used). (ic) would in fact be false if John didn't eat more apples than Bill yesterday. From the point of view developed here, the question is why is perfective morphology together with past tense not compatible with a (non-implicational) abilitative use of the modal, rather than asking how perfective aspect plus past tense change the bare *ability-can* so that it all of a sudden gives rise to an actuality implication. I'd like to suggest that it is essentially the same reason why spatio-temporal modifiers are infelicitous. The modal base of an ability modal is defined by IL-properties of the subject, those tend to hold throughout a significant portion of the history of the subject. Since past tense together with perfectivity (denoting "completion") describe a momentary situation (before the speaker's now) a bare ability modal would be infelicitous.



- (78) a. JOHN usually beats Bill  
 "In most cases in which someone beats Bill it is John who does it"  
 b. John usually beats BILL  
 "In most cases in which John beats someone, he beats Bill"

Why should that be so? First of all, it seems necessary to have a non-symmetric determiner to get a truth-conditional effect by contrastive focus. (i.e. *sometimes* instead of *usually* won't work in (78)) and since *can* is existential, we don't expect that to begin with.<sup>64</sup> However, there is a way in which focus via scalar implicatures seems to give different abilities. Consider the contrast in (79)

- (79) a. John can beat even BILL (who is the best chess player in club)  
 b. Even JOHN can beat Bill (who is therefore one of the worst chess players in the club)

If we had to assess John's qualities as chess player he would be very good by the standards of the club in (79a) but at the lower end of the ranking in (79b). Note that the licensing of scalar implicatures is a general property of abilitative modals but not of other modals.

- (80) a. John can beat a chess MAster  
 b. (therefore:) John can also beat a chess novice
- (81) a. John must/might beat a chess MAster  
 b. # therefore: John must/might beat a chess novice

Hence, topic focus articulation does effect the constitution of the modal base (even though it doesn't show up in the truth conditions). This allows me to get back to the analysis of IL-behavior with ability modals. Recall, that I proposed a presuppositional treatment rather than a vacuous binding analysis of the fact that spatio-temporal modifiers are infelicitous with ability modals. There is a second part of Kratzer's story that I haven't mentioned yet, namely how the interpretation of indefinite NPs, in particular bare plurals, interacts with IL- and SL-predicates. Let's continue testing the hypothesis that whenever the modal base is defined exclusively by IL-properties of the subject (and/or object) the construction behaves like an IL-predicate.

## 6. Bare Plurals

Kratzer's main concern in the (1988,95) paper is the interaction between syntactic positions of arguments and their interpretation - assuming (something like) Diesing's mapping hypothesis, which demands material outside of the VP to be part of the restriction of a (possibly silent) Q-

<sup>64</sup> Brennan (1997) gives the following examples to show that some modals are - contrary to Chierchia's claim sensitive to focus. (b) can be paraphrase as "If the cabinet is going to resign it must do so by April 10th." while a means that according to the relevant laws the cabinet has to resign by April 10th.

- (i) a. The cabinet must resign by April 10th  
 b. The cabinet must resign by APRIL 10th

adverb and material inside the VP to be in the nuclear scope. Assuming subjects of IL-predicates to be always outside of the VP<sup>65</sup> explains the interaction between bare plurals and IL.

- (82) a. Firemen are available  
 b. Firemen are altruistic

(82a) is (multiply) ambiguous, it can mean that there are available firemen, a reading that is not accessible for (38b). According to the mapping hypothesis this follows because the subject in (38a) is not the external argument of the predicate, thus it's base position is inside the VP. The reconstruction of the subject in its base position puts it under the scope of existential closure which gives rise to the reading in question. Since there is no situation argument in (38b) the subject is the designated external argument which entails that it is base generated outside of VP. Thus, it is always in the restrictor of the (silent) Q-adverb which gives rise to the generic flavor of the sentence. Note, that we can't maintain that analysis because we concluded that all predicates have a situation argument.<sup>66</sup>

Under certain circumstances, modals are assumed to be able to bind variables provided by indefinite descriptions, i.e. modals display the quantificational variability pattern with indefinites. A clear case is given in (39) where the predicate under the modal is already an IL predicate (cf, Brennan(1993)). The indefinite subjects in these cases have the quantificational force of the modal.

- (39) a. A basketball player can/may be short<sup>67</sup>  
 b. A basketball player will/must have good eyesight.

If the main predicate is a SL-predicate, an existential reading seems available with all modals (although a generic reading is certainly preferred) except *ability-can* which induces a always generic reading.

- (40) a. A policeman must/may/might/will swim (right now) across the lake  
 b. A policeman can swim (#right now) across the lake  
 c. A policeman can (right now) see Mary.

An apparently related observation can be made with bare plural subjects and 'for-adverbials': compatibility with temporal 'for-modifiers' is a classic test for stative or process denoting predicates (atelicity). "Explode" is grammaticalized as telic predicate, thus incompatible with a

<sup>65</sup> In Kratzer's story this is so because only one argument of a predicate can be designated as external argument. If a predicates has a Davidsonian argument slot, then this is always the external one, if there is no argument position for spatio-temporal chunks then the designation of the external argument proceeds according to a theta-hierarchy according to which agents are more prominent than Experiencers which in turn are more prominent than themes, ...

<sup>66</sup> Furthermore, for *ability modals* it is not clear how one would even formalize Kratzer's proposal. Diesing's suggestion, however seems a candidate. In fact her proposal for IL-predicates is motivated from common analyses of the difference between epistemic modals and root modals in terms of differences in the argument structure.

<sup>67</sup> For independent reasons, having to with the IL-status of the predicate the ability reading is not available here. Interestingly enough, coercing the predicate 'be-short' into an active reading 'acting as if short' allows the ability reading in which case the quantificational force of the indefinite subject is generic as in (40b)

for-adverbial as shown in (41a). A bare plural subject as in (41b) gives rise to a stative reading of the whole sentence (cf. Katz 1994:11).<sup>68</sup>

- (41) a.?? A bomb exploded for 3 hours  
b. Bombs exploded for 3 hours

The relevant observation for our discussion is given in (42). While modals in general don't have an effect on the aspectual properties of the main predicate, *ability-can* is once more special. A way to describe this in terms of Kratzer's proposal is to say that it doesn't allow the bare plural subject to reconstruct which is presumably necessary for it to do the aspectual surgery on the main predicate so that it is compatible with the for-adverbial.<sup>69</sup>

- (42) a.?? A bomb might/must/may/will explode for 3 hours  
b. Bombs might/must/may/will explode for 3 hours  
c.?? A bomb can explode for 3 hours  
d. # Bombs can explode for 3 hours

To close the section on IL-properties with *abilitative modals*: We saw that *ability modals* behaved entirely like IL-predicates - they were incompatible with spatio-temporal modifiers and always induced a generic reading of an indefinite (bare plural) subject while *opportunity-modals* acted systematically like SL-predicates: they allow spatio-temporal modification and they permit existential readings of indefinite or bare plural subjects. I gave an argument to the effect that the first part of the generalization (incompatibility with spatio-temporal modifiers) can't be due to the lack of variable (at least in the technical sense). Instead, I adopted a presuppositional story. The second part of the generalization regarding the interpretation of indefinite and bare plural subjects is still unaccounted.

### 3.3.3 Raising or Control: Some remarks on the syntax of *ability-can* and *opportunity-can*

Alluding to the traditional view most prominently advocated by Jackendoff (1972) on the difference between root modals and epistemic modals, Diesing (1992) suggest that the difference between IL-predicates and SL-predicates is that the former have a control structure (INFL of IL-predicates assigns the blank theta-role "has the property x" to its specifier) like root modals while SL-predicates are raising structures like epistemic modals.

- (83) a. [John<sub>i</sub> might [<sub>t<sub>i</sub></sub> be in his office]]  
b. John must [PRO be in his office].

<sup>68</sup>Katz doesn't give an analysis for (41).

<sup>69</sup>'explode' is an unaccusative verb, so maybe the bare plural subject incorporates into the verb at LF so that the resulting meaning would be something like "bomb-exploding happened for 3 hours". In addition we need to assume that only bare nouns can incorporate and that plurality is essential because it adds divisibility and cumulatively to the predicate.

Together with the Mapping Hypothesis (VP external material will be mapped into the restrictor of a generic operator while VP internal material ends up in the nuclear scope (cf. Diesing (1992:10)) this accounts for the core set of facts about the interpretative possibilities of indefinite subjects. In this section I'd like to discuss briefly the main arguments for a control structure for *abilitative-can*<sup>70</sup> which is commonly assumed to be the prototypical case of root modals.

Halt. The previous remark needs to be relativized already, I guess, because only true *ability-can* shows the hall marks of IL-predicates while *opportunity-can* doesn't. Hence, it least for some abilitative modals we have to assume a raising structure (to keep the parallelism between *opportunity modals* and SL predicates). Therefore, the need for justification for the control structure in the case of *ability-can* is even greater.

Furthermore, looking from a distance, the control proposal seems to be nothing more than a particular execution of a constraint that bars the interpretation of the subject below the *ability-can*. There are of course other proposals in the literature to guarantee the same restriction for IL-predicates, e.g. the focus semantics of Rooth(1992, 1995). Since we have already a well motivated components in the AA skeleton that is pragmatically determined (recall that the modal base was assumed to be a free context variable subject to pragmatic anaphor resolution) and was in shown to be sensitive to the topic focus articulation (although the relation between the focus marked constituent and the phonetic realization is not all to clear), it would be nice to be able to do without a control vs. raising dichotomy.

Certainly, the idea that *ability-can* has it's own theta-role to assign is undesirable from the point of view advocated in this paper. Recall that it would be desirable to have only one lexical entry /can/ that is used in all modal frames. The lexical information that comes with it could possibly be just that it relates two sets of worlds intersectively. All other components of *ability-can* are provided by the skeleton and well motivated there (instead of inside /can/). In fact the leading idea behind proposing the skeleton was that the typical meaning of AAs arises compositionally and is not linked to one lexical entry. Hence, we would expect a variety of constructions to come along with that meaning even though, there is no *can* overtly present. An additional theta-role carried by *ability-can* would not only be superfluous but contradicting the main idea.<sup>71</sup> Not only that, recall that the meaning *opportunity-can* arose as soon as the modal base had at least one property that wasn't tendentially stative. In other words, the subject seems to still get the "ability theta" role from the modal in the sense that IL-properties are in the base even though a raising configuration is projected. I.e. it seems to result in inconsistency to suppose a raising-control dichotomy to account for the different behavior of *ability-* and *opportunity-can*. Since it seems that we need a raising structure anyway, the control structure is discredited.<sup>72</sup>

<sup>70</sup> Recall, that for the semi-modals *be able to* and *be capable of* we have compelling evidence that they have their own theta role to assign (e.g. they are incompatible with an expletive subject, ...) By standard assumptions, this means that a control structure realizes the AA skeleton.

<sup>71</sup> Although I have to concede, that the semi-modals seem to represent exactly that case, which weakens the conceptual argument given in the text considerably.

<sup>72</sup> Note that this time, the fact that *be able to* has both abilitative readings doesn't undercut the argument, since there is no raising to begin with.

Furthermore, focus semantics seems to handle AAs quite well. Here is a very brief and entirely informal sketch of how it should work in principle and how it would apply in a few cases (note, that (84c) is predicted to be at least 3 ways ambiguous which seems correct): The modal base will be filled with the focus value of the utterance, i.e. propositions that are just like the ordinary semantic value of the proposition except that every F-marked constituent is replaced by an existentially quantified variable.<sup>74</sup>

- (84) a. John<sub>F</sub> can swim *opportunity-can*  
 Given that there is someone who swims in the world of evaluation (= the conditions for swimming are met), there is a circumstantially accessible world which John swims.
- b. John can swim<sub>F</sub> *ability-can*  
 Given that there is John in the world of evaluation (with all his essential properties) there is a world circumstantially accessible in which he swims.
- c. A lot of people<sub>F</sub> can jump<sub>F</sub> into this pool *IL-properties of the pool*  
 Given that there is someone that does something with / to the pool in w (= given the essential properties of the pool like size, ...) there is a world in which a lot of people jump into the pool

Not only does it seem to work just fine but it also accounts for meanings that abilitative modals can have, that I haven't found discussed in the literature (as e.g. the 3 ways ambiguous sentence in (84c)<sup>75</sup>). Note, that this treatment makes AAs look very much like adverbially quantified sentences. I think, that this is not an indication that the proposal is on the wrong track but rather to the contrary. It might lead us to an answer to the question what similarities and differences are between present tense generics and AAs. Recall from the introduction, present tense generics seem to have a secondary meaning where the express exactly an AAs which brings me to the last question to be briefly addressed in this paper.

- (85) a. This car goes 20 miles per hour.  
 b. John plays tick tack toe  
 c. This machine crushes oranges.

#### 4. Are AAs generic or existential? 2 sides of the same coin

Recall the second problem mentioned in the introduction. It seemed that the truth-conditions we got from the assumption that there is an existential modal that relates modal base with the nuclear set intersectively, the resulting truth conditions were too weak.

- (86) a. John can swim

<sup>73</sup> An empirical argument against control comes from Wurmbrand (1997). She proposes that true control allows "imperfect control" while "apparent control" as in restructuring contexts (note that modals are prototypical restructuring verbs) doesn't. While (ia) is fine even though the verb in the complement clause demands a group of individuals as subject (imperfect control) the (ib) is odd. In fact it is only felicitous if the mayor has a split personality.

- (i) b. Der Buergermeister will/plant sich in der Kirche versammeln  
 'the mayor wants/plans to gather refl. in the Church'  
 a. # Der Buergermeister kann sich in der Kirche versammeln  
 'the mayor can refl. gather in the Church'

<sup>74</sup> See appendix for the precise semantic characterization of the meaning.

<sup>75</sup> The example is originally due to Jon Nissenbaum pc.

- b.  $\exists w'[w'R_C w] \& [John\ swims\ in\ w']$   
 c. "Given John's physical and mental properties in w there is a world w' accessible from w such that John swims in w' "

The intuition was that if John can swim then he will swim in *more or less all* situations that meet basic felicity conditions rather than just in at least one of them. Hence the suspicion, that maybe a modal operator with quasi-universal force might describe the truth-conditions more appropriately as repeated below.

- (87) a. John can swim  
 b.  $GENs[John\ in\ s \& C(s)] \exists s[s\ overlaps\ with\ s' \& John\ swims\ in\ s']$ <sup>76</sup>  
 c. "All situations that include John and certain felicity conditions are met are expandable to situations in which he swims."

Assuming a situation semantic framework as proposed in Kratzer (1989) it is possible to compare these two proposals. Here are the cornerstones of the framework: Situations are seen as parts of possible worlds. Situations stand in a part whole relation (" $\leq$ "). For every situation s in the set of situations S there is exactly one maximal situation  $s_{max}$ , such that s is part of it ( $s \leq s_{max}$ ). Those maximal situations are called world. Finally, the set of situations is closed under mereological summation, which means any 2 (3,4,...n) situations can be joined to form a bigger situation that contains all the joiners and there is no constraints like spatio-temporal adjacency. Finally, given mereological summation, we need a notion of minimality, so that we don't get lost counting situations. I repeat here a definition of Minimality from Berman (1987), Heim (1990)<sup>77</sup> that has to be modified quite a bit so that it will do the work we want it to do.<sup>78</sup> The intuition is that minimal situations don't have any proper sub-situations.

- (88) Minimality  
 For any set of situations S, the set of minimal situations in S,  
 $min(S) = \{s \in S : \forall s' \in S (s' \leq s \Rightarrow s' = s)\}$

Furthermore, here are lexical entries for an existential modal operator that relates only (or typically) sets of maximal situations (worlds) as well as a adverbial quantifier with quasi-universal force that is assumed to quantify over non-maximal situations.

- (89) a.  $[[CAN]] = \lambda p_{\langle s,t \rangle} \lambda q_{\langle s,t \rangle} \dots$  there is at least one maximal situation  $s_{max}$  s.t.  $p(s_{max}) = q(s_{max}) = 1$   
 b.  $[[USUALLY]] = \lambda p_{\langle s,t \rangle} \lambda q_{\langle s,t \rangle} \dots$  for most situations s s.t.  $p(s) = 1, q(s) = 1$

To compare generic/quasi-universal quantification over situations smaller than a world with existential quantification over worlds we need one more notion that allows us to describe what it means for a proposition to be true in a non-maximal situation compared to being true in a world - persistence.<sup>79</sup> Here is Kratzer's (1989) definition:

<sup>76</sup> I borrowed the overlap relation from Chierchia(1995)

<sup>77</sup> quoted from von Stechow (1995)

<sup>78</sup> cf. von Stechow class notes spring (1997)

<sup>79</sup> I basically use Kratzer's (1989) proposal unchanged. Whether propositions can or have to be persistent is very much under debate. My contribution here is not a real argument in favor of it. Rather it is like Kratzer's own

(90) a. **Persistence**

A proposition  $p \in P(S)$  (the powerset over  $S$ ) is persistent if and only if for all  $s$  and  $s' \in S$  the following holds: Whenever  $s \leq s'$  and  $s \in p$  (i.e.  $p$  is true of  $s$ ) then  $s' \in p$ .  
(If a proposition is true of  $s$  it is true of all bigger situations  $s'$  that contain  $s$ )

I abstract away from a lot of complicated issues concerning the underlying ontology and leave it at this intuitive level. Assume, that (at least<sup>80</sup>) some propositions obey (90), that means that for any one of these persistent propositions  $p_p$  it is either true in the world or false. What is not possible, is that  $p_p$  is true of some situations  $s$  but not also true of the world. Note, that it does not mean that if  $p_p$  is true of one situation it has to be true of all situations of the world. The intuition is rather that some propositions are such that if they are true of a situation it is because of an essential feature of the world it is due to a non-accidental property of the world. Now assume that what the generic operator does is "lift a proposition that is accidentally true of a situation in the world" to the status of a proposition whose truthfulness is non-accidental. Here is how it would be defined (cf. Kratzer 1989:43)

(91) **Generic Operator**

for any variable assignment  $g$ :

$[[G(\alpha)]]^g$  is true in a situation  $s \in S$  iff there is a  $s' \in S$  such that  $s \leq s'$  and  $[[\alpha]]^g$  is true in  $s'$

Given the assumptions made so far, the generic operator will, as Kratzer remarks act "like a possibility operator in modal logic." i.e.  $G$  takes any accidental proposition (whether expresses already a generalization or not) true of any kind of situation and maps it on to 1 iff that proposition is found to be true in all worlds that contain the original situation up to the level of the maximal situation. In short,  $G$  makes transforms any non-persistent proposition into a persistent proposition. Yet, in another way of speaking  $G$  applied to  $p$  returns 1 iff there is world  $s_{max}$  s.t.  $p$  is persistent in  $s_{max}$ .

Here is where my contribution comes in. Obviously,  $G$  will not be truth conditionally equivalent to any old existential modal operator. I'd like to suggest that it is exactly the circumstantially restricted modal operator that acts as demanded. The intuition is that a circumstantial base is a set of worlds all of which share the essential properties governing the bringing about of the situation in question (natural laws).<sup>81</sup>

If this were true, and of course it is highly speculative at this point, that would mean that for all intents and purposes it doesn't matter whether we assume a generic operator over situations or an

rationale: "wouldn't it be nice if it were so. My appreciation comes from the hope that there is really a systematic reason that accounts for the fact that AAs behave just like a special kind of generic.

<sup>80</sup> Kratzer hypothesizes that it is a deep property of natural language that natural language propositions are persistent.

<sup>81</sup> Note that the focus semantic treatment seems to allow a natural way of selecting the relevant natural laws from the irrelevant ones. Here are a few focus values that will select a different set of laws:

f0 = [There is someone who causes a swimming situation] --> felicity conditions for swimming (possibly ranked)

f1 = [John bringing about some kind of situation] --> John's counterparts with all his IL-properties

f2 = [There is someone who sees someone else] --> arrangement of object relevant for directing ones gaze from location A to B

...

existential operator over worlds. There are truth conditionally equivalent. That means for instance, that all AAs are generic statements. Truth-conditionally, that is inconsequential. However, if it is true we'd expect all AAs to act like other generic sentences. For ability-can that is trivial. We have seen, that behaves essentially like an IL-predicate, exactly as expected under this story. But what about opportunity-can? Recall, that  $G$  was defined in such a way that it could turn any accidental generalization into a non-accidental one. This means, that we shouldn't expect every generic statement to behave like an IL-predicate, i.e. a non-accidental generalization over times. Specifically, we'd expect "episodic generic" sentences. Fortunately, there are tests for genericity that don't hinge on stable stativity. For instance, licensing counterfactual reasoning is a property attributed to generic sentences. Indeed by this test, our old *opportunity-can* comes out as generic (as episodic generic, that is).

(92) a. A star gazer can see the solar eclipse of this year from the Cayman islands

So if you were a star gazer and if you were on the Cayman islands at the right time you would see this year's solar eclipse.

b. John can see Mary from where he is standing.

So if you were standing in his place, you would see Mary.

Intuitively, the set of situations the generic operator quantifiers over is not distributed in time it could be located within one tiny interval, still it says that whoever is in this situation located at John's position and has normal eyesight and directs his/her gaze towards Mary will succeed in seeing Mary. This is the key to another notoriously difficult to handle problem: what are the licensing conditions if any (free choice and polarity). It has been noted that *any* is typically licensed negative and modal as well as in generic contexts. Dayal (1995) observed that *any* is licensed also in what I just called episodic generics. If it is taken to be a defining property of the people John talked to, a reading that (93a) has, then apparently *any* is licensed in a what seems to be an extensional context par excellence.

(93) a. John talked to any woman who came up to him

b. \* John talked to any woman.

This is of course not an analysis of the distribution of *any*, but it might open door to one just enough to see why I think that "it would be nice" to have persistent propositions to be able to bridge generic quantification over situations and existential quantification worlds in the manner I suggested. Here is another puzzle: excluded middle.

Recall that the existential statement of the truth conditions seemed too weak. (and probably still does, since persistence didn't really address that question). Let's see what happens, if we negate the ability-modal<sup>82</sup>. All of a sudden, it seems that the existential force would give us the right

<sup>82</sup> Which I have studiously avoided till now. Kratzer in her dissertation (1978) seemed to have put the opposite strategy to use, almost all her examples to illustrate ability are negated. I think for a good reason, ability-can appears much more well behaved if negated than if it is not. The interaction of abilitative modals with negation is its own research project, however.

semantics, since the negated ability statement is very strong. There is no (relevant) world in which John swims or the elevator lifts 1500 lbs or more.

- (94) a. John can't swim.  
b. This elevator can't lift 1500 lbs.

This behavior of *ability-can* is very reminiscent of excluded middle phenomena which occur canonically with generic sentences and in conditionals (e.g. von Stechow(1996)) It seems that the proposal I made here not only suggests a non-obvious unification of excluded middle contexts but might also have the key to understanding the phenomenon better.<sup>83</sup> Since the generic operator essentially elevates the proposition to a persistent one, it can, like natural laws either hold or not hold in particular world.

Before I conclude, I tiny remark to the original question about the right characterization of the truth conditions of AAs. It seems to me that the intuitions shift with the context from one extreme to the other. Compare (95a,b) where b is uttered in the following situation. Mary plays darts. Unfortunately her motor skills are so weak that a situation in which she hits the bull's eye occurs with very  $1/n$  likelihood where  $n$  stands for the number of trajectories possible for her. I.e. for all intents and purposes she has no control where the dart ends up once she releases it. The odds are of course not 0, though very small. Still, in this situation one could use (95b) truthfully to describe the circumstances.

- (95) a. John can swim  
... is true iff whenever he tries and nothing unusual happens he succeeds"  
b. Mary can hit the bull's eye.  
... true because there is at least a slight possibility that she hits it. even though it would occur entirely accidentally

I conclude from that that there is always going to be some proficiency standard that is silently assumed against which ability is measured. The standard shifts from situation to situation. Hence the pragmatics is the right place to deal with that question and not the semantics.

## 5. Summary and Prospect

I have proposed a semantic core postulated to be at the heart of the meaning of a considerable variety of constructions, AAs in the most general way of speaking. I have shown that for constructions that involve *abilitative-can* the semantic skeleton did pretty well in handling the data. I.e. minimally, the skeleton made it possible for me to look at very difficult to control data in a consistent way without being lost encountering a new fact.<sup>84</sup> To test whether there is even some truth to the proposal, it seems necessary to ask very specific questions right at the interplay

<sup>83</sup> The usual treatment seems to be I guess to stipulate an "all-or nothing" presupposition of the operator or construction.

<sup>84</sup> That happened all too often during the process of writing this paper.

between morpho-syntax and semantics. In other words, the most pressing question is, which one of the components (if any) is projected in the syntax so that it interacts with well-studied morpho-syntactic processes. The list of constructions and phenomena to look at, is quite long: Topic Focus Articulation, AA and Negation - specifically excluded middle phenomena. Episodic and non-episodic generics and the licensing of any, middles, easy adverbs/adjectives, abilitative suffixes, present tense generics and *ability-can*, ...

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